

DE GNOMONE
MERIDIANO
BONONIENSI
AD DIVI PETRONII

Deque obſervationibus Aſtronomicis eo inſtrumento ab ejus conſtructione

AD HOC TEMPUS PERACTIS

AUCTORE

EUSTACHIO MANFREDIO

BONONIENSIS GYMNASII AC SCIENTIARUM INSTITUTI ASTRONOMO.



BONONIÆ MDCCXXXVI.

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NOBILISSIMIS VIRIS

MARCHIONI ALOYSIO ALBERGATO

Præsidi perpetuo

COMITI FRANCISCO MARIÆ SIGNIO

COMITI PAULO PATRICIO ZAMBECCARIO

MARCHIONI HIERONYMO COSPIO

MARCHIONI SIGISMUNDO MALVETIO

COMITI SIGHIZZO BLANCHETTO

Bononiæ Senatoribus

DIVI PETRONII BASILICÆ PRÆFECTIS

Eustachius Manfredius S. P. D.

NON fuit mihi ambigendum cui potiſſimum opuſculum hocce meum inſcriberem, jam enim annos ab hinc fere quadraginta cum illud adornare cæpi tacito quoddam animi mei judicio Vobis (Viri nobiliſſimi) addixeram ac nuncupaveram, ratus ea re non tam officium a me Vobis præſtari quam debitum quoddam perſolvi. Agitur enim in hoc libro de meridiana illa li-

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nea quam Anteceſſores Veſtri magno cæleſtis diſciplinæ commodo in nobiliſſima civitatis baſilica, cujus procurationem geritis, ſtatuerunt, ac ſummo deinceps ſtudio expendendam, reintegrandam, ornandam curarunt; cui inſtrumento non cives modo, ſed exteri etiam, quotquot aſtronomiam colunt, maximos hujuſce artis progreſſus acceptos referunt. Ejus ergo inſtrumenti, atque adeo perpetuæ Veſtræ erga optimas diſciplinas voluntatis hiſtoriam ſervari ad neminem magis quam ad Vos attinet; quam equidem hiſtoriam cum Viri celebres Joannes Dominicus Caſſinus, Dominicus Gulielminus abſolutiſſimis commentariis a ſe conſcriptam Vobis obtulerint, aliqua tamen fiet illi ex hoc libro acceſſio, in quo non tam operis deſcriptionem (quod illi præſtiterunt) quam ejus uſum, atque utilitates inde perceptas ſum proſecutus. Non modo enim obſervationes quæ hac linea a primis ejus temporibus peractæ fuerant recenſui, ſed multo plures adjeci quas ipſe per me vel per ſocios habui, quippe qui, ut primum hæc ſtudia attigi id mihi ſumpſi ut perpetua (quoad fieri poſſet) earum obſervationum ſeries extaret. Id ergo totum, qualecumque eſt, ſi Vobis (Viri ſummi) acceptum fuiſſe cognovero & ego curam eandem perſequar quoad vivam, & ad immortalia illa quibus ampliſſimus ordo veſter me fratreſque meos exornavit beneficia novus quidam ac maximus ab humanitatis Veſtræ teſtimonio cumulus accedet. Valete

Kalendis Juliis MDCCXXXV.

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DE GNOMONE BONONIENSI
A C
MERIDIANIS
OBSERVATIONIBVS
EO HABITIS.

TRadituruſ earum obſervationum ſeriem, quæ hoc Bononienſi gnomone a prima ejus conſtructione in hunc diem octoginta annorum ſpatio a viris celeberrimis habitæ, a me vero ſummo ſtudio conquiſitæ ordinatæque ſunt, rem non modo legentibus gratam, ſed plane neceſſariam facturum me exiſtimavi ſi initio de gnomonis ipſius fabrica atque uſu, tum de multiplici ejus examine ac reſtitutione, poſtremum de ea quæ ab hiſce obſervationibus in rem aſtronomicam promanavit, aut promanare adhuc poterit utilitate paucis verba facerem. Quamquam enim & pleraque ex his quæ ſum dicturus e recentiorum aſtronomorum libris, in quibus frequens meridianæ hujuſce lineæ eſt commemoratio, peti poterant, & vero ſummus ipſe aſtronomus Joannes Dominicus Caſſinus, tam præclari inſtrumenti artifex accuratam ejus deſcriptionem juſto opere eſt complexus, tamen neque ullus extitit qui ea attingeret, quæ ad poſtremos hoſce annos pertinent, neque ex legentium commodo futurum videbatur ſi ad harum obſervationum rationem omnem percipiendam aliorum librorum adjumento indigerent. Id autem eo libentius facere inſtitui quod ejuſmodi enarratio cum quadam reſtauratæ hoc & ſuperiore ſæculo aſtronomiæ hiſtoria erit conjuncta. Pleræque enim circa Solis motum difficultates, quæ veteribus moram injecerant, hocce inſtrumento (quippe omnium quæ uſpiam aſtronomos tractare noverim maximo) ſublatæ, diremptæque ſunt; ac facile etiam inducor ut credam quæcumque ad ſummam in hoc negotio ſubtilitatem deſiderari adhuc videntur ejuſdem præſertim ſubſidio inventum, ac perfectum iri, ſi modo in ea indagine anteceſſorum ſolertiam poſteri æmulentur.

Caput Primum.

De prima inſtrumenti conſtructione.

TEmplum eſt Bononiæ Divo Petronio Civitatis Epiſcopo ac Patrono ſacrum, ante annos 340 in ipſo fori conſpectu publica auctoritate exſtructum, opere ac magnitudine in paucis Italiæ ſpectabile. Procuratio ædis penes Senatum eſt, proventus ex publico attributi, quos quinqueviri biennales una cum præſide perpetuo e patrum ordine adlecti adminiſtrant. Longitudo templi, quàm nunc ab intimo odei receſſu porrigitur ad valvas, quæ in forum ſpectant, pedum eſt Bononienſium 335; latitudo pedum eorumdem 105 præter ædiculas, quæ utrimque extrorſum projectæ pedes 46 ad eam menſuram adjiciunt (Ichnographiam ſubjecta huic libro tabula exhibet) Symetria eſt ejuſmodi uti in ea, quamquam ex mediæ ætatis barbarie profecta, neque dignitatem, neque venuſtatem quandam deſideres. Octogonæ columnæ ædis totius ſpatium in tria ambulacra (naves vocant) ſecundum longitudinem dirimunt, quibus navibus totidem a foro januæ reſpondent. Medianæ navis altitudo ex teſtudinum umbilicis ad pavimentum pedum eſt circiter 120, reliquarum pedum amplius ſeptuaginta. Necdum tamen tanta hæc moles ad architecti exemplum eſt abſoluta, quæ ſi aliquando abſolvatur, vix ulla erit, opinor, baſilica quæ cum hac amplitudine contendat. Itaque & celeberrimis Romanorum Pontificum, Regum, ac principum virorum conventibus nobilitata eſt, & in ea Carolus V. Cæſar a Clemente VII. ſummo Pontifice in maxima Europæ frequentia Romani imperii inſignia ſuſcepit.

Ceterum ædificii ad cæli plagas is eſt poſitus ut fronte ſeptentriones, poſtico auſtrum ſpectet, ac propterea fere ſecundum meridianum in longum protendatur, modice ſcilicet (quippe gradus omnino tredecim) ex cardine boreo in ortum deflexum. Propter haſce opportunitates cum de æquinoctiis reſtituendis, ac univerſa anni Juliani ratione emendanda, Gregorio XIII. Pontifice, rumor increbuiſſet; Egnatius Dantes Bononienſis gymnaſii mathematicus auctor fuit uti in hac æde regula marmorea ſterneretur, quo immiſſo per ſublime foramen Solis radio annuæ ejus converſiones, earumque articuli obſervando expenderentur. Neque tamen eam regulam in ipſa meridiani directione ſtatui laboravit, neque vero in partes diſtribuit, aut ad perpendiculi menſuram exegit, quippe qui ſolſtitiorum tantummodo tempora ex maximo, aut minimo ſolaris imaginis ad verticem acceſſu perſcrutari ſatis duxit; atque hoc pacto hybernum ſolſtitium anni 1576 in diem 11 Decembris incidiſſe comperit. Extat adhuc in navi orientali ejus lineæ veſtigium octonis ut minimum gradibus a meridiano in ortum declinans. Foramen erat in lamina ante feneſtram in ſummo pariete meridionali, qui paries id temporis fuit

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ædis poſticus. Verum anno 1653 producto meridiem verſus ædificio, novoque Fornice ad priores quinque adjecto, paries ille eſt dirutus, neque Egnatii linea uſui deinceps fuit.

Ex eo itaque tempore de gnomone alio ſubrogando agitatum eſt. Plerique Egnatianam regulam ipſam in ſpatium ex novo adjectum ſimili poſitu transferendam, ac Solis radium per parietem recens conſtructum excipiendum cenſebant. Contra Joannes Dominicus Caſſinus qui Bonaventuræ Cavalerio ante biennium ſuffectus matheſim publice profitebatur, Solem ex ipſa potius teſtudine, quippe parietibus ſublimiori, admittendum ſentiebat, ac lineam in meridiano deſcribendam, quam toto anno irradiaret; hoc enim pacto, dimenſis ad perpendiculum lineæ partibus quas ſolis imago quotidie attingeret, præſtantiſſimum inſtrumentum paratum iri, quo minimæ quælibet motus differentiæ atque inæqualitates diſtingui poſſent. Verum huic rei cum multæ intercedebant difficultates tum in primis obliquus ille Ædis ad meridianum poſitus obſiſtere judicabatur. Quicumque enim ſive in mediana ſive in altera laterali concameratione locus eligeretur unde Solem immitti placeret, neceſſe erat ad hunc toto anno ac præſertim per hyemem meridie excipiendum, lineam ipſam tantæ longitudinis fieri uti ex altera in alteram navim procurreret; id autem quominus ſuccederet columnarum quæ naves diſterminant craſſitudinem obſtituram plerique ominabantur; quippe tam modicam fore meridianæ lineæ ad columnarum lineam inclinationem, uti per intercolumnium inoffenſis baſibus tranſduci non poſſet; atque eam videlicet Danti fuiſſe ajebant cauſſam cur ex obliquo priorem illam lineam ſtatuiſſet.

Erat hæc ſane res in ſumma menſurarum ſubtilitate poſita. Caſſinus primum exſquiſitis obſervationibus per eas horas habitis quibus horis Sol ipſam ædis frontem ſtringeret certiſſime comperit quo angulo parietes, atque adeo columnarum directiones ad meridianum inclinarentur. Dein ducta linea quæ columnarum duarum proximarum baſes alternatim tangeret, angulum eſt dimenſus, quem linea hæc cum ea comprehenderet, quæ per baſeon centra duceretur; quem angulum ubi priore illo aliquanto minorem reperit, audacter fortaſſe, ſed ex propriæ artis fiducia polliceri non dubitavit nihil per columnas obſtiturum quominus meridiei linea ex alia in aliam templi navim traduci poſſet. Ceterum nullum opportuniorem fore locum, quam ſi inter columnas illas duas tranſmitteretur, quibus columnis fornix ad lævam ab ingreſſu ſecundus incumbit, Solis vero radius ex quarta teſtudine ortivæ navis non longe a pariete exceptus in lineam incideret; ita enim futurum ut neque hæc eas templi partes occuparet, quæ potiſſimum ſacris ceremoniis addictæ ſunt, & tamen longitudinem habere poſſet gnomonis duplam ſeſquialteram, quantam requiri noverat quo per ipſum hybernum ſolſtitium Solem acciperet.

Cum ejus rei rationem omnem ſcripto declaraſſet, ac vir ſummus Cornelius Marchio Malvaſia de eo ad Senatum retuliſſet, patribus rem perfici, ac Caſſino negotium dari placuit. Ille perducta inter columnarum anguſtias ea quam meridianam futuram noverat linea, ac pluribus in eam demiſſis perpendiculis ſummo ſtudio punctum ipſum in teſtudine inveſtigavit in quo foramen ſtatui oporteret, ut neque pro puncti altitudine ſpatium ad juſtam lineæ lon-

gitudinem deficeret, neque tamen nimio ſuperaret. Poſquam punctum illud reperit in eo loco laminam cum rotundo foramine ad horizonem libratam collocat, tectumque quantum oportet ſuperius patefacit. Punctum aliud in pavimento ſub centro foraminis perpendiculo deſignat. Ubi omnia recte habere comperit mathematicos, literatoſque alios viros ad diem ipſum æſtivi ſolſtitii, 21 Junii 1655 publico programmate invitat. Programma in hæc verba conceptum erat: *In hoc æſtivo Solſtitio cæleſti ſcientiæ a fundamentis inſtaurandæ in templo D. Petronii primus lapis ponitur: præſens Solſtitium obſervatur: via Solis circa meridiem deſcribitur: ibì in pavimento meridiana linea quam Sol ab altiſſima orientalis fornicis parte intromiſſus toto anni decurſu in ipſo meridiei puncto illuſtrabit, quotidianis Solis, Lunæque & inſigniorum ſiderum obſervationibus, phyſicіſque experimentis accomodata, inoffenſo tramite deſcribitur, & publicæ cenſuræ exponitur die* XXI *&* XXII *Junii, civilis horologii hora* XV.

Cum omnium ordinum concurſus factus eſſet, meridie appetente, ut primum Solis ſpecies in pavimentum delapſa eſt, in ipſo pavimento (quod antea hoc loci ad libellam componendum curaverat) veſtigium curvæ ſemitæ ab utroque ſpeciei margine peragratæ delineat, atque ad aliquod temporis poſt meridiem proſequitur. Dein circulari arcu deſcripto, cujus circuli centrum in perpendiculi puncto ſitum erat, earum ſemitarum quas delineaverat alteram in punctis duobus interſecat, ſectionum intervallum bifariam dividit. Perſpicuum erat ab aſtronomicis rationibus fore uti linea quæ ex arcus centro ad medium illud punctum recta duceretur, cæleſti meridiano congrueret. In eo itaque poſitu filum quam rectiſſime poteſt intendit. Tum vero mira hominis ſolertia omnium oculis ſe ſe prodidit; filum enim recta inde productum inter columnas illas duas ita dirigi apparuit ut earum baſes tantum non perraderet. Denique aliis exaratis circulis, aliiſque cum utraque illa marginum ſemita notatis ſectionibus experiri placuit an idem meridiani poſitus inveniretur, neque uſpiam diſcrimen repertum eſt quod ad decimam pollicis partem exſurgeret, pleriſque viri acumen, quibuſdam & ſortem extollentibus. Sed fortunæ ſane fuerit eam eſſe columnarum collocationem uti meridianum ſolem nuſpiam interciperent; illa vero quantæ artis atque induſtriæ fuiſſe exiſtimamus hunc ipſum adamuſſim poſitum præſenſiſſe, Solemque in anguſtiſſimum illum tramitem ex deſtinato induxiſſe, atque omnia ita ordinaſſe ut non tam ad meridianam lineam inveniendam quam ad fidem inventæ adſtruendam Solis ope indiguiſſe videretur?

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Caput II.

Inſtrumenti deſcriptio.

NUnc vero quæ ad perficiendum deinceps aptandumque cæleſtibus obſervationibus inſtrumentum adjecta fuerunt non eo ordine perſequar quo effecta ſunt, ſed illud potius quemadmodum his diebus viſitur abſolutum deſcribam.

Meridiana hæc linea ex ferrea conſtat regula tranſverſum digitum lata, inter regulas duas marmoreas unciarum duarum latitudine pavimento infixa, atque ab eo puncto navis ortivæ, cui puncto foramen ſolem admittens in teſtudine imminet, per templi intercolumnium fere ad frontis parietem prope medianæ januæ latus porrecta. Regulæ illæ intercolumnium adeo ex obliquo pervadunt ut ferrea quidem columnarum neutram attingat, marmoreæ vero ſingulæ ſingulas diſtringant, ac propterea aliquid de harum angulis abradi oportuerit. Gnomonis vicem in hocce inſtrumento gerit perpendiculum, quod a centro foraminis demiſſum in ipſum ferreæ regulæ caput, atque in medium ejus latitudinis punctum incidit. Foramen circulare eſt in lamella plana ex orichalco. Lamella quadrato lapidi cochleis adſtringitur, qui lapis cum ipſa teſtudine calce coagmentatus eſt. Ne autem foraminis margines ob lamellæ craſſitudinem aliquem Solis radium, cum præſertim obliquius incidit, interciperent, ita excavata eſt lamella ut foramen concavam fruſti conici aut potius ſphærici ſuperficiem referat, ſuperiori parte quantum opus erat patulum, inferiori in aciem deſinens. Eapropter planum foraminis, ejuſque centrum, quod in definienda gnomonis altitudine attenditur in inferiori lamellæ facie eſt poſitum. Eam altitudinem pedum Bononienſium 71 unciarum 5 Caſſinus eſt dimenſus; ſed quo facilius ex obſervationibus calculi ineantur, in partes æquas centum dividi, ſingulas vero centeſimas in particulas mille ſubſectas cogitari placuit. Centeſimarum diſtributio in lignea regula perpendiculi altitudinem æquante peracta eſt; eoque opere centeſimæ ſingulæ uncias ipſas decem pedis Pariſienſis comprehendere inventæ ſunt; unde conſit altitudo tota unciarum Pariſienſium mille. Partis centeſimæ modulus extat in lamina paraſtadi inſerta ad caput lineæ meridianæ, in millenas ipſe partes diſpertitus, quo menſuræ ad centeſimas milleſimas altitudinis particulas definiri queant. Earum particularum foraminis diameter centum comprehendit.

Jam marmorea regula quæ ex parte orientis ferreæ adjacet e ſegmentis pluribus in longitudinem continuatis compingitur; hæcque ſegmenta ſingula ad duas ipſas altitudinis centeſimas dimenſa ſunt. Numeri ſegmentorum terminis perpetuo ordine adſcribuntur, qui terminorum ſingulorum a perpendiculi puncto diſtantiam per ejuſmodi partes dinumeratam indicent. Numeratio ad 250 centeſimas cum linea ipſa finitur; hunc enim præterpropter extremum limitem radius ab imo Solis margine per brumale ſolſtitium attingit; hinc longitudo lineæ fit pedum Bononienſium omnino 178, unciarum 6 ſemis. Cete-

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rum cum ob juncturarum aſperitates nonnihil ambigui eſſent in marmoribus centeſimarum termini, regula ipſa ferrea anno 1695, cum inſtrumentum a Caſſino redintegratum eſt, inciſuris e regione numerorum illorum appoſitis, diſtincta fuit, aliæque præterea inciſuræ mediis locis adjectæ, quibus jam non binæ, ſed ſingulæ partes centeſimæ longe certius diſcriminentur, maxima enim cura eſt adhibita ut inciſurarum diſtributio quam exactiſſima eſſet.

Regula porro alia marmorea quæ ab occidente eſt, ex pluribus & ipſa lapidibus, ſed longitudine minime inter ſe ſe paribus jungitur. Singuli enim lapides ſingulis gradibus meridiani circuli reſpondent, qui gradus a vertice ad Solem, vel ad aliud Sidus numerantur cum ad ejus lapidis terminum radium emittit, quemadmodum adnotati lapidibus numeri oſtendunt; itaque lineæ extremum paullo ultra gradum octavum & ſexageſimum excurrit, quod ea in Bononienſi meridiano diſtantia ſit Solis a vertice maxima. Verum hæc graduum notatio vix quicquam ad obſervationes ipſas conducit, ſed ad uberiorem quemdam organi inſtructum videtur adjecta; gradus enim, & graduum partes longe accuratius ex prioris regulæ dimenſionibus computari poſſunt.

Etſi vero regula utraque e tot lapidum ſegmentis coaleſcit omnium tamen ſuperficies coæquata eſt, atque ad eundem cum perpendiculi puncto horizontalem poſitum ſtudioſiſſime exacta. Id vero ope aquæ in canali juxta lineam collocato conſiſtentis effectum eſt, cujus aquæ ſuperficies ab initio lineæ ad ejus extremum pertinebat. Lapides enim eouſque attollebantur, aut deprimebantur, quouſque ſinguli parem cum puncto perpendiculi a ſuperficie aquæ altitudinem ſervarent. Sed qui rationem omnem atque artificium quo hæc ſingula peracta ſunt ſcire cupit, legat licet quæ Caſſinus in hujuſce inſtrumenti hiſtoria vernaculo idiomate conſcripta ac Bononiæ anno 1695 edita tradidit, quæque Dominicus Gulielminus eidem libro adjecit.

Ceterum ne quid operi deeſſet aptati ſunt ad regularum latera quadrati lapides iis locis ſingulis, quæ ſolaris ſpecies attingit quum Sol ſingula Zodiaci ſigna ingreditur, inſculptis ex adverſo ſignis duobus, altero aſcendentis eclipticæ ſemicirculi, deſcendentis altero, quorum ſignorum initia eoſdem circulos æquatori parallelos deſcribunt. Ad ipſum Cancri initium, in quo puncto fit Solis converſio, elliptica ejus ſpecies delineata viſitur quo loco, quaque magnitudine in ſolſtitio æſtivo anni 1655 eſt obſervata. Idem in tropico Capricorni factum eſt, poſtquam hyemali anni 1656 ſolſtitio imaginis magnitudo, & ſitus eſt animadverſus, qui locus ad boreale extremum lineæ eſt poſitus, imagine ipſa nonnihil ultra 250 perpendiculi centeſimas porrecta. Præterea lapidibus aliis juxta orientalem regulam inciſæ ſunt horæ ipſæ quæ ab occaſu ſolis ad ejuſdem ortum intercedunt, quibus diebus Solis ſemita per eas lineæ partes tranſit. Denique fruſta alia marmorea ex parte occidentis ſita indicant dena quælibet ſcrupula tertia totius terræ ambitus, quæ ſcrupula ab initio lineæ ad ſingula hæc marmora interſunt; cum enim linea continenti aquæ ſuperficiei æquidiſtans ſit poſita, minime recta eſt, ſed curva, a meridiani tamen plano nuſpiam deflexa, ac propterea eas diviſiones ſuſcipit quibus circulorum arcus diſpertiri ſolemus. Eſt autem ex Caſſini rationibus tota lineæ longitudo ejuſcemodi ſcrupulorum 130, ſive ſecundorum 2, tertiorum

10, paullo amplius, nempe totius meridiani circuli pars præterpropter ſexcentimilleſima; id quod in anta interiori medianæ januæ atramento deſcriptum, non tamen inciſum voluit.

Caput III.

De meridianis obſervationibus hac linea habendis, atque a penumbra corrigendis.

PRoximum illud eſt ut oſtendam quo pacto meridianæ obſervationes hocce inſtrumento peragantur, atque adeo peractæ ſint eæ omnes, quas in hac ſerie tradimus. Id vero ex iis quæ dicta ſunt facile intelligitur. Meridie enim, quum Solis ſpecies a ferrea regula biſſecta apparet, utriuſque ſpeciei marginis ſemita diligenter attenditur, ac lineolæ duæ in contiguis marmoribus cultelli acie, aut rubrica exarantur, quas lineolas margines ipſi inter progrediendum perradant, id quod unicus obſervator haud difficulter præſtat, commodius autem duo, qui ſinguli in ſingulos imaginis limbos intendant. Deinde circino, aut tæniola ex charta intervallum utrumque accipitur, quod inter notam, ac proximam illi ferreæ regulæ inciſuram intercedit, numeruſque centeſimarum perpendiculi, qui inciſuræ reſpondet exſcribitur, qui numeri in orientali regula marmorea alternis inciſuris e directo ſunt appoſiti; atque illud etiam advertitur an nota ultra inciſuram, cujus exſcribitur numerus boream verſus, an citra eam verſus initium lineæ exarata ſit, uti ex eo appareat num acceptum intervallum ſuper centeſimas in ſummam ſit imputandum, an vero ſubducendum. Tunc intervallum ipſum quot partium milleſimarum unius centeſimæ ſit ex modulo ad caput lineæ poſito exploratur, atque ita Solaris utriuſque marginis a perpendiculi puncto diſtantia ad centeſimas milleſimas particulas colligitur.

Neque diſpar eſt ratio ſi de Luna obſervanda agatur, quod interdum experiri placuit. Luna enim cum pleno orbe lucens meridianum pertranſit ſatis nitidam ſui ſpeciem in hac linea efficit. Ad ejus autem ſpeciei margines definiendos nihil aptius inveni, quam ſi charta alba in ipſa ſpecie ſtatuatur, ac ſenſim verſus ſpeciei marginem ita reducatur, ut chartæ limbus rectis ſemper angulis lineam interſecet; ubi vero inter reducendam chartam nihil amplius luminis ab ea delibari appareat, ibi charta ſiſtatur, tum vero lumen e laterna proferatur ac punctum ipſum notetur in quo chartæ limbus lineam ſecat.

Ejuſmodi autem menſurarum quas hæc linea ſuppeditat quanta ſit ſubtilitas ex eo intelligi poteſt, quod particulis illis ſingulis vix uſpiam duo ſecunda ſcrupula meridiani circuli reſpondeant, quinimo ubi obliquior eſt Solis poſitus ne tres quidem aut quatuor particulæ in obſervatione neglectæ unius ſecundi ſcrupuli diſcrimen inferant, quemadmodum ex his quæ paullo poſt dicemus percipi poterit. Ne quid tamen ſilentio prætereaın duo ſunt quæ tantæ huic obſervationum certitudini nonnihil detrahant. Alterum quod imago terminis

nis non uſque adeo certis circumſcripta ſit, ſed oras ancipites, quippe ex lucē in umbram gradatim evaneſcentes habeat, præſertim ubi vapores, aut nubeculæ æquabili quadam luce perfuſæ Solem obſepiant. Altera eſt cauſa perpetua quædam, utut exigua, imaginis agitatio, ac quaſi ſubſultus; hic autem eo major deprehenditur quo Sol nitidior, ac magis purus eſt aer, ac quantum animadvertiſſe mihi videor non alius æſtate atque hyeme, ſi ejus tremoris quantitatem ex angulorum quos ſubtendit menſura æſtimemus. Verum hiſce difficultatibus quadantenus occurritur ſi eadem in utroque ſpeciei limbo notando ratio ſervetur, nempe ſi utrinque aut vividiſſimus, aut maxime languidus lucis terminus accipiatur, ac utrinque etiam vel extimus, vel intimus eligatur limes, quem trepidatione illa ſpecies attingit; ita enim fiet ut ſi vel minus accurata limborum determinatio fuerit, in ipſo tamen Solaris centri poſitu inde eliciendo vel nihil, vel longe minus errari poſſit; id quod ex dicendis fiet perſpicuum.

Jam vero iis menſuris quæ in linea actæ ſunt primum omnium correctio quædam eſt adhibenda, cujus correctionis neceſſitas a foraminis amplitudine oritur. Imaginis enim AIBR (*Figura* 1.) cujus extremitates A, & B in meridiana linea PK notantur, ultima illa ora AIBR minime a radiis per centrum foraminis C tranſeuntibus efformatur, ſed ab aliis, qui foraminis DE circumferentiam diſtringunt; atque ideo extremum B a radio BDM, qui radius ex auſtrali Solis limbo M profectus foramen in boreali ejus termino D ingreditur, extremum vero A a radio AEF, qui ex boreo margine F ad auſtralem foraminis partem E emittitur. Quod ſi eam tantum imaginem quæ a radiis per centrum C tranſeuntibus effingeretur attendamus (quemadmodum in hac indagine attendi oportet) ducendæ erunt per C rectæ duæ CG, CH, duabus BD, AE æquidiſtantes, ac meridianæ lineæ occurrentes in G, & H; puncta enim hæc duo G, H imaginis ejus meridianos terminos deſignabunt, quod rectæ illæ CG, CH propter immanem Solis diſtantiam veluti radii duo ſpectari poſſint ex iiſdem ſolaris diſci punctis F, M promanantes, e quibus BD, AE promanant; ac propterea imago illa figuram ellipſeos HNGT, verticibus G, H definitæ referre videretur, niſi radii alii e toto foraminis ſpatio illapſi coronam illam AIBR ipſi circumponerent. Ut ergo centralium tantum radiorum ratio habeatur, linea PA, quæ a perpendiculi puncto P ad propiorem ſpeciei terminum A pertinet, ac ſuperiori, ſive boreo ſolis limbo F reſpondet, augenda eſt quantitate HA, puta ſemidiametro foraminis CE, quæ ſemidiameter partium eſt centeſimarum milleſimarum perpendiculi quinquaginta; PB vero, quæ ſcilicet remotiorem imaginis partem B determinat, & ad inferiorem, ſive meridionalem limbum ſolis ſpectat, quantitate eadem CE, ſive CD, aut BG minuenda. Hoc pacto linearum PH, PG menſuræ conflantur, quas *tangentes correctas a penumbra*, quemadmodum PA, PB *incorrectas*, appellare conſuevimus. Sunt enim ipſæ PH, PG tangentes trigonometricæ angulorum PCH, PCG, ſive (producto ad verticem Z perpendiculo PC) angulorum ZCF, ZCM, nempe diſtantiarum apparentium a vertice utriuſque Solis limbi F, M, ſi perpendiculum PC pro radio ſtatuatur, ac radius partium centummillium eſſe cogitetur.

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Sed ne in hoc ipſo ullus ſuboriatur ſcrupulus, propterea quod meridianam hanc lineam minime rectam eſſe, ſed in circularem arcum inflexam ſupra poſuimus, eſto arcus ille, quem tota ejus longitudo occupat, AB (*Figura* 2) ſcrupulorum nempe ſecundorum 2, tertiorum 10, centrum vero ejus arcus, atque adeo telluris, punctum C, per quod actæ ſint ſemidiametri CA, CB, atque eum arcum tangat in A recta AD, rectæ CB occurrens in D, jungaturque AB. Primum illud certum eſt arcum AB a tangente AD nihil deficere quod ſenſu percipi poſſit, quando ne ipſa quidem ſubtenſa AB, quæ arcu AB minor eſt, ab AD quicquam ad ſenſum deficit, cujus rei periculum facere licet in triangulo BAD, ſi AB ponatur partium 250000 (quæ totius meridianæ lineæ, ſive arcus AB eſt longitudo ex perpendiculi modulo) atque ex notis angulis BDA (qui ſcilicet complementum eſt anguli C, ſecundorum 2. 10) & BAD (quem ejuſdem anguli C dimidium eſſe conſtat) rectæ AD longitudo, quàm ſubtiliſſime licet inveſtigetur, nullum enim invenietur diſcrimen quod longe infra unam ex illis 250000 particulis non conſiſtat. Jam ergo in eodem triangulo ſi iiſdem datis quæratur BD prodibit particulæ unius cum triente. Eſto gnomonis altitudo AG, ipſi CA continua, & juncta GB ſecet AD in puncto K. Quoniam autem poſita AB partium 250000 angulus G, diſtantia ſcilicet a vertice Solis ſolſtitio hyemali, graduum eſt præterpropter 68, erit angulus GKA, vel BKD grad. 22; & cum angulus D a recto vix differat, fiet in triangulo BDK tertius angulus B iterum graduum fere 68. Ut ergo ſinus anguli K, grad. 22 ad ſinum anguli B, gr. 68, nempe ut 3 ad 9 fere, ita BD, quam ſupra invenimus particulæ unius cum triente, ad DK quæ propterea erit particularum earundem plus minus 4. Tantulum ergo eſt diſcrimen inter AK, tangentem ſcilicet anguli AGK, & rectam AD, ſive arcum AB, quem arcum pro ejus anguli tangente uſurpamus; atque idem methodo magis directa, ſed operoſiore calculo invenietur ſi in triangulo BAG, in quo angulus A, & latera circa eum nota ſunt, angulus G eruatur tum vero ejus anguli tangens AK cum ſubtenſa AB, ſive cum arcu ipſo AB conferatur. Porro particularum 4 differentia in ea radii GB obliquitate vix ſecundi ſcrupuli diſſidium efficit in angulo AGK; ac multo etiam minores differentias prodire neceſſe eſt, ſi obſervatio in puncto alio quovis, inter A & extremum lineæ B interjecto peracta ſit. Tuto igitur Meridianæ lineæ etſi nonnihil curvæ, menſuras obſervatione inventas, atque ut prædictum eſt correctas, pro ipſis diſtantiarum a vertice tangentibus ad calculos aſſumimus.

Caput IV.

De loco Solis cum apparenti, tum vero in meridiano inveniendo.

HIs peractis facile apparet quid agendum ſuperſit ut ſolaris centri in meridiano circulo poſitus definiatur. Ex tangentibus enim correctis anguli ipſi diſtantiarum utriuſque limbi Solis a vertice per canonem trigonometricum, poſito radio partium 100000, nullo negotio eruuntur. Deinde ſi apparens tantum centri locus quæratur, eorum angulorum is qui minor eſt e majori ſubducitur, differentiæ dimidium minori adjungitur, vel de majori aufertur, ac centri diſtantia a vertice conflatur, arcus ſcilicet meridiani qui a vertice ad locum in quo centrum Solis apparet, intercedit, atque apparentis ab horizonte altitudinis eſt complementum.

Sed cum propter radiorum refractiones quas in athmoſphæra fieri aſtronomi deprehenderunt, ſidera omnia vertici propiora videantur quam ſunt, Solem autem alicui præterea parallaxi haud prorſus contemnendæ obnoxium eſſe iidem arbitrentur, cujus ea eſt natura ut contra ſidus a vertice remotius quam eſt oſtendat, neceſſe eſt ut qui locum ejus verum, in quo ſcilicet nulla refractione aut parallaxi interveniente e telluris centro ſpectaretur, aſſequi optat hujuſce cauſæ utriuſque rationem habeat. Eſt autem refractionis menſura & pro diſtantiæ a vertice diverſitate diverſa, & eadem ſervata diſtantia aliis aſtronomiæ ſcriptoribus alia, nec ſecus de parallaxi exiſtimandum. Pro eo igitur ac quiſque hujus, aut illius aſtronomi auctoritatem ſequitur, opus eſt uti ex ejus numeris refractionis quantitatem exquirat quæ utrique illi apparenti limborum ſolis a vertice diſtantiæ competit, atque eam ſingulis diſtantiis adjiciat; tum vero & parallaxeos quantitatem ex his, quas præeligendas putat aſtronomicis tabulis petat, eamque diſtantiis iiſdem ſubducat; vel quod expeditius, ſingularum diſtantiarum parallaxes e ſingularum refractionibus auferat, ac reſiduum diſtantiis ſemper addat, refractio enim, cum de Sole agitur, ſaltem ex recentiorum hypoteſibus, prævalet, Solemque magis attollit, quam parallaxis deprimat. In hunc finem tabellam refractionum, parallaxibus antea expunctis, ex Caſſini ſententia ſubjeci, iis tantum diſtantiis a vertice aptatam quas in meridiano Bononiæ Sol per anni ſpatium aſſequitur. Hac vero tabella ipſa & ego in univerſa obſervationum ſerie ad calculos exigenda uſus ſum, & qui volet uti poterit. Sed de harum menſurarum electione plura in loco dicam.

Tabel-

Tabella refractionum ſolarium, deductis parallaxibus, ex Jo: Dominici Caſſini hypotheſibus.

Diſt. app. a vert.		Refract. deducta parall.		Diſt. app. a vert.		Refract. deducta parall.		Diſt. app. a vert.		Refract. deducta parall.	
G	'	'	''	G	'	'	''	G	'	'	''
20.	30	0.	19	37		0.	39	53.	30	1.	11
21			19	37.	30		40	54		1.	12
21.	30		20	38			41	54.	30	1.	13
22			20	38.	30		42	55		1.	15
22.	30		20	39			43	55.	30	1.	17
23			21	39.	30		43	56		1.	19
23.	30		21	40			44	56.	30	1.	20
24			22	40.	30		45	57		1.	22
24.	30		22	41			46	57.	30	1.	24
25			23	41.	30		47	58		1.	26
25.	30		23	42			48	58.	30	1.	28
26			24	42.	30		48	59		1.	30
26.	30		24	43			49	59.	30	1.	32
27			25	43.	30		50	60		1.	34
27.	30		25	44			51	60.	30	1.	36
28			26	44.	30		51	61		1.	38
28.	30		27	45			52	61.	30	1.	40
29			27	45.	30		53	62		1.	43
29.	30		28	46			54	62.	30	1.	45
30			29	46.	30		55	63		1.	47
30.	30		30	47			56	63.	30	1.	49
31			30	47.	30		57	64		1.	51
31.	30		31	48			58	64.	30	1.	54
32			32	48.	30	0.	59	65		1.	57
32.	30		32	49		1.	0	65.	30	2.	0
33			33	49.	30	1.	1	66		2.	3
33.	30		34	50		1.	3	66.	30	2.	6
34			34	50.	30	1.	4	67		2.	9
34.	30		35	51		1.	5	67.	30	2.	12
35			35	51.	30	1.	6	68		2.	16
35.	30		36	52		1.	8	68.	30	2.	20
36			37	52.	30	1.	9				
36.	30	0.	38	53		1.	10				

Ubi igitur apparentibus diſtantiis ſolarium limborum a vertice hæc adhibi-

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ta fuerit a refractione ac parallaxi emendatio, tum vero ex diſtantiæ alterius cum altera collatione earum differentia elicitur, nempe ſolis diameter (quantum hæc per hujuſcemodi obſervationes definiri poteſt) ac diametri dimidium minori diſtantiæ adjectum, vel ex majori ſubductum, veram centri diſtantiam a vertice efficit, quæ veræ altitudinis eſt complementum; atque hoc pacto verum in meridiani circulo Solis poſitum obtinemus.

Sed hæc omnia, quæ hoc & præcedenti capite diximus exemplo illuſtremus, uti rei univerſæ ratio vel iis pateat qui ab hiſce ſtudiis mediocriter exculti ſunt. Exemplum autem ex ipſis hujuſce ſeriei obſervationibus petemus, ut hæc quæ tradimus præcepta in iis obſervationibus ad calculos revocandis ſervata fuiſſe appareat.

Exemplum. Anno 1696 die 10 Novembris Dominicus Gulielminus tangentes in hac linea notavit utriuſque marginis Solis, inferioris quidem partium 190174, ſuperioris vero partium 185882. Calculi ergo ita ponendi erunt.

		Limbi inferioris		Limbi ſuperioris
Tangentes incorrectæ		190174		185882
Semidiameter foraminis	ſub.	50	ad.	50
Tangentes correctæ		190124		185932
Diſtantiæ a vertice apparentes quæ tangentibus correctis reſpondent in Canone trigonometrico	gr.	62.15.24	gr.	61.43.38
Refractio deducta parallaxi, e ſuperiore tabella	ad.	1.43	ad.	1.40
Diſtantiæ veræ limborum a vertice	gr.	62.17.7	gr.	61.45.18
Diſtantia minor e majori ſubducenda	gr.	61.45.18	Semid. ap. ad.	15.54
Differentia quæ eſt Solis diameter apparens		31.49	Diſtantia vera centri Solis a vertice	gr. 62.1.12
Ejus dimidium ſive apparens ſemidiameter		15.54		

Sciendum autem ſolares diametros, quæ hujuſcemodi obſervationibus, quantumvis accurate habitis, inveniuntur, perpetuo minores reperiri quam ſi iiſdem diebus per teleſcopium, ſive excepta in charta Solis imagine, ſive aptato micrometro, ſeu denique notato ope horologii automati tempore excurſus Solis per horarios circulos, inveſtigentur; cujus rei minime obſcura eſt ratio. Radius enim ille ultimus SA, (*Figura 3.*) vel MD, a quo imaginis oram extimam definiri diximus, cum omnium a Sole unicus in punctum A, vel D incidat haud ſatis efficax eſſe poteſt quo viſibilem ſui ſpeciem in pavimento, præſertim feneſtrarum lumine, radiiſque aliis undique ex diverſo repercuſſis illuſtrato, effingat; quinimo exiſtimandum ne plures quidem alios prope cum interiores radios obſervatori ſat manifeſtos eſſe poſſe, donec ad certam ab extima ora diſtantiam ventum ſit, quæ tot denique e diverſis Solis partibus

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accipiat ut eorum impreſſio ſat valide viſum percellat. Pro eo enim ac alia atque alia puncta interiora ſumimus, certum eſt ex opticis rationibus plures ex iis punctis Solis partes detegi; atque hinc ſane illa quam diximus marginum ambiguitas ac luminis prope eos per gradus extenuatio. Eo igitur fit ut obſervator numquam puncta ipſa A, & D in meridiana linea notet, ſed interiora alia, veluti B, & E, pari intervallo ab iis diſſita, ſi modo diligenter curat ut pari utrimque luminis gradu ſpeciem determinet. Itaque quum menſuris ab eo actis correctionem deinde illam partium 50, quaſi puncta A, & D notata forent, adhibemus, nimis ſpeciem contrahimus, & intra centralem imaginem FG, veluti in I, & H excurrimus; propterea pro vera Solis diametro, quæ ad centrum foraminis C ſubtenditur, nempe GCF, prodit nobis angulus juſto minor ICH. Ejuſmodi tamen in taxanda diametri quantitate fallacia in ipſo centri poſitu nihil turbat; niſi forte vel diverſam ad A, & D luminis oblique incidentis attenuationem, vel angulorum quos æquales rectæ HF, GI ad C ſubtendunt diſparitatem morari velimus, quæ ſane geometricæ ſubtilitatis ſunt, aſtronomicam vero indaginem præ eorum exiguitate prorſus effugiunt.

Id potius ex uſu foret ſi illius diminutionis certa quæpiam regula conſtitui poſſet, cujus regulæ ope ab obſervata diametro ICH veram GCF arguere liceret. Caſſinus diametros quæ ab hiſce obſervationibus inveniuntur ſexageſima præterpropter ſui parte augendas arbitratus eſt. Mihi quamplurimas hujuſce ſeriei obſervationes expendenti quæ per hyemis initium habitæ eſſent, quum Sol haud longe a perigæo diſtat, ac mediam quamdam inter omnes menſuram attendenti non valde a vero abludere viſa eſt hæc ratio. Aſt ubi eas aggrederer obſervationes, quæ æſtate ineunte cum Sol prope apogæum verſaretur, ſunt habitæ, haud paullo majus quam partis ſexageſimæ diſcrimen comperiebam. Eſt enim Solis perigæi diameter GCF ſcrupulorum 32. 46, atqui angulus ICH, qui Decembri exeunte obſervatione elicitur ſcrupulorum eſt 32. 11, diſcrimine ſecundorum 35, quæ anguli ipſius ICH pars eſt quinta & quinquageſima. In apogæo autem, hoc eſt ſub exitum Junii diameter GCF ſcrupulorum eſt 31. 40, at ICH obſervari ſolet ſcr. 30. 51 quæ ab illa deficit ſecundis 49, puta hujuſce anguli parte octava & triceſima. Sed neque rationes conſtare comperi ſi pro angulis lineas ipſas GF, IH inter ſe ſe conferrem. Si quidem prope perigæum centralis imaginis longitudinem GF partium eſſe 6650 calculi oſtendunt, propterea quod Sol eo tempore gradus circiter 67. 45 a vertice recedat; atqui IH reperitur tunc ex obſervatione 6530; differentia eſt partium 120, quæ lineæ IH pars eſt quarta & quinquageſima; prope apogæum vero, ubi Sol 21 gradibus a vertice abeſt, GF colligitur ex computo partium 1062, ſed IH obſervatur partium 1036, diſcrimine partium 26, nempe quadrageſimæ partis rectæ IH. Ac perdifficile arbitror haſce diametrorum diminutiones ex opticis tantum principiis certo aſſequi, præſertim cum phyſicæ cauſæ plures, eæque mutabiles interveniant, quæ nullis adſtringi ſe legibus patiuntur. Itaque accuratæ diametrorum menſuræ teleſcopiis potius quam hoc inſtrumentorum genere inveſtigandæ ſunt.

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Caput V.

De poli altitudine, & Eclipticæ obliquitate præcognoſcendis; ac Solis longitudine exinde ſupputanda.

POſtquam locus Solis in meridiano inventus eſt; ut ejus in ecliptica quoque poſitus eruatur, qui aſtronomis longitudo dicitur, duo præcognoſci neceſſe eſt: primum altitudinem poli in hac ipſa Divi Petronii æde, ubi obſervationes peraguntur, quæ geographica loci latitudo appellatur, deinde eclipticæ ad æquinoctialem circulum inclinationem, quæ obliquitas eclipticæ dicitur. Ne vero hæc duo ex aliorum ſcriptis petenda ſint, utrumque eadem opera ex hac ipſa obſervationum ſerie cognoſci poteſt, ſi eæ quæ per ſolſtitii utriuſque tempus habitæ ſunt conſulantur. Quos autem in dies, ac etiam præterpropter horas ſolſtitia ſingulis annis incidant ſatis certo ex ephemeride quapiam compertum eſſe poteſt. Etſi vero non eſt neceſſe ut ſolſtitii utriuſque obſervatio eodem anno habita ſit, ac ne illud quidem ut alterutra ſaltem eo ſit peracta quo illa in qua Solis poſitum quærimus (quod nimirum in tropicis punctis eædem fere ſingulis annis tangentium dimenſiones recurrant) ſecurius tamen propiora quam remotiora ſolſtitia ad hanc indaginem eliguntur.

Igitur ad utriuſque ſolſtitii diem diſtantiam veram centri Solis a vertice ex meridianis obſervationibus collige, tum æſtivam ab hyemali ſubducito, differentiæ enim, nempe tropicorum diſtantiæ, dimidium erit eclipticæ obliquitas, quam ubi æſtivæ diſtantiæ adjeceris, vel hyemali ademeris, loci latitudinem conflaveris. Atque hæc quidem ratio accuratiſſima eſt quum ſolſtitium vel meridie, vel paucis ſive ante, ſive poſt meridiem horis committitur; aſt ubi paullo magis a meridie abſit, diſtantia a vertice eo die obſervata correctiuncula indiget ut ad ipſum Cancri, aut Capricorni tropicum redigatur. Eam correctiunculam habes in ſubjecta tabella, cujus numeri longitudini Solis attributi ſunt, quam longitudinem habet meridie ejus diei, vel etiam pridie aut poſtridie quam ſolſtitium committitur. Hanc vero correctionem, cum de æſtivo ſolſtitio agitur, meridianæ diſtantiæ a vertice ſubducendam memento, cum de hyberno addendam. Id ubi præſtiteris, tum vero utere diſtantiis correctis, quæ ipſæ erunt diſtantiæ tropicæ, ſeu ſolſtitiales, ac reliqua uti dictum eſt perage.

Ta-

Tabella correctionis diſtantiæ meridianæ centri Solis a vertice prope ſolſtitia ut fiat diſtantia tropica a vertice.

Longitudo Solis.		Correctio diſt. a vert.	
Sign.	G '	*ſec.*	
♊ ♐	28. 25	34	1. 35
	28. 30	31	1. 30
	28. 35	27	1. 25
	28. 40	24	1. 20
	28. 45	21	1. 15
	28. 50	19	1. 10
	28. 55	16	1. 5
	29. 0	14	1. 0
	29. 5	11	0. 55
	29. 10	9	0. 50
	29. 15	8	0. 45
	29. 20	6	0. 40
	29. 25	5	0. 35
	29. 30	3	0. 30
	29. 35	2	0. 25
	29. 40	1	0. 20
	29. 45	1	0. 15
	29. 50	0	0. 10
	29. 55	0	0. 5
	30. 0	0	0. 0 ♋ ♑
			Longit. Solis.

Exemplum eſto in utroque ſolſtitio anni 1697. Die ergo 20 Junii ejus anni, quo die ephemerides ſolſtitium contigiſſe oſtendunt, meridianam diſtantiam veram centri Solis a vertice in hac ipſa obſervationum quas tradimus ſerie ex tangentibus notatis ſupputatam invenies grad. 21. 1. 13. quoniam autem ex ephemeride longitudo Solis meridie fuit grad. 29.37. Geminorum, correctionem diſtantiæ illi adhibendam ſuperior tabella exhibet ſecundorum 2, ſubducendam nempe e diſtantia a vertice grad. 21. 1. 13. (quandoquidem de æſtivo ſolſtitio agitur) ut fiat tropici æſtivi diſtantia a vertice grad. 21.1.11. Die porro 20 Decembris, quo ex ephemeridum numeris Sol Capricorni initium attigit, extat in eadem ſerie diſtantia a vertice obſervata gr. 67. 58. 9. Erat longitudo Solis meridie gr. 29. 28 Sagittarii; unde ex tabella correctio eſt ſecundorum 3, & ea quidem diſtantiæ a vertice addenda, quod de brumæ ſolſti-

tio

tio agatur. Fiet igitur diſtantia ipſius tropici Capricorni a vertice gr. 67. 58 12. En ergo rationum progreſſum:

Diſtantia tropica centri Solis a vertice hyemalis	gr. 67. 58. 12
Diſtantia tropica æſtiva	gr. 21. 1. 11
Differentia	gr. 46. 57. 1
Differentiæ dimidium, nempe obliquitas eclipticæ	gr. 23. 28. 30
Hæc diſtantiæ tropicæ æſtivæ adjecta, vel hybernæ ſubducta conficit	gr. 44. 29. 41

quæ eſt latitudo, ſive altitudo poli Bononiæ in æde D. Petronii.

Potes etiam poli altitudinem per inerrantium ſtellarum obſervationes exquirere, ejus præſertim quæ ab hoc ipſo polaris ſtellæ nomen accepit, cui obſervandæ hæc ipſa meridiana linea præſto eſt, inſtrumento quodam illi aptato, quod in hoſce uſus ſervatur. Verum de univerſa hac tum obliquitatis eclipticæ, tum latitudinis indagine pluribus infra agam, ubi & numeros hoſce hoc exemplo repertos, nimirum obliquitatis grad. 23. 28. 30, & latitudinis grad. 44. 29. 41 minime perpetuos eſſe apparebit.

Poſtquam autem duo hæc quæ præcognoſcenda erant comperta habueris, confer latitudinem loci cum diſtantia centri Solis a vertice ejus diei, quo die locum Solis in ecliptica ex obſervatione requiris, horumque arcuum duorum minorem e majori aufer, reſiduum enim erit diſtantia centri Solis ab æquinoctiali circulo, quam aſtronomi declinationem appellant; hæcque ſeptentrionalis eſt ubi diſtantia centri a vertice loci latitudine minor fuerit, meridionalis ubi major. Deinde logarithmum ſinus declinationis cum logarithmo radii in ſummam confer, atque ex ea ſubtrahe logarithmum ſinus obliquitatis eclipticæ; fietque logarithmus ſinus ejus arcus, qui a proximo æquinoctio ad centrum Solis intercedit. Si ergo declinatio ſeptentrionalis fuerit, & Sol ab æquinoctio verſus ſolſtitium tendat, hic arcus erit ipſa longitudo Solis ab initio Arietis, ſin autem a ſolſtitio ad æquinoctium progrediatur, inventum arcum aufert ex gradibus 180, ut longitudinem efficias. Quod ſi declinatio ſit meridionalis, adde ab æquinoctio ad ſolſtitium arcui illi gradus 180, a ſolſtitio vero ad æquinoctium ipſum arcum deme e gradibus 360, & utroque caſu quæſita longitudo conflabitur.

Veluti in eo exemplo, quod ſuperiori capite poſuimus, diei ſcilicet 10 Novembris 1696.

Erat diſtantia meridiana centri Solis a vertice vera	gr. 62. 1. 12
Latitudo loci nuper inventa, ſubducenda	gr. 44. 29. 41
Fit declinatio centri meridionalis	gr. 17. 31. 31
Logarithmus hujuſce declinationis cum logarithmo radii	1947874
Logarithmus obliquitatis eclipticæ nuper inventæ gr. 23. 28 30 ſubducendus	960026
Fit logarithmus diſtantiæ Solis a proximo æquinoctiali puncto	987848

Eſt

Eſt ergo hæc diſtantia	gr.	49.6.27
Addantur gradus 180, quod declinatio ſit auſtralis, & Sol per eos dies ab æquinoctio ad ſolſtitium pergat	gr.	180
Fit longitudo Solis	gr.	229.6.27
Sive Scorpionis	gr.	19.6.27

CAPUT VI.

De harum obſervationum ſerie, quemadmodum ordinata & unde deprompta fuerit.

HActenus inſtrumenti conſtructionem ejuſque uſum in Sole obſervando præcipuum ſum proſecutus. Verum ne illi qui hac obſervationum ſerie uti voluerint neceſſe habeant eas omnes quas diximus ſupputationes inire, ſingulis ſeriei obſervationibus computum adjunxi, quem tamen nonniſi ad diſtantiam veram centri Solis a vertice perduxi. Licet enim & declinationes quoque, & longitudines ad plures annos ſupputaſſem, aut ſupputandas curaſſem, tamen cum declinatio a loci latitudine pendeat, cujus menſuram nonnihil ipſam ſibi diffidentem invenimus, longitudo autem, præter declinationis incertitudinem, ab eclipticæ obliquitate, quæ minime conſtans videtur, iterum haud parum ambiguitatis contrahat, de utriuſque electione liberum cuique judicium relinquere malui.

Prima igitur ſeriei columna habet tangentem utramque eo die qui adſcriptus eſt obſervatam, ſed correctam a penumbra pro foraminis ſemidiametro, uti dictum capite III, quarum tangentium duarum prior ad limbum inferiorem ſive auſtralem Solis, poſterior ad ſuperiorem ſive boreum ſpectat: Columna ſecunda arcus exhibet diſtantiæ apparentis utriuſque ejus limbi a vertice, qui arcus in canone trigonometrico tangentibus correctis reſpondent: Tertia arcus diſtantiæ a vertice veræ, nempe a refractione, ac parallaxi expurgatæ ſecundum Caſſinianos numeros, quos capite quarto in tabella tradidimus: Quarta differentiam diſtantiæ veræ duorum limborum a vertice, ſive Solis diametrum, quanta hoc inſtrumento apparuit: Quinta denique diſtantiam veram centri Solis a vertice, ſeu veræ altitudinis complementum. Ubi advertendum in hac ſerie nullam rationem eſſe habitam vitiorum quæ interdum ſive in gnomonis foramine, ſive in lapidum libramento deprehenſa fuerunt, quibus ſane de cauſis diſtantiæ Solis a vertice, præſertim circa annum 1722, alioſque ſuccedentes, nonnihil corrigendæ ſunt. Sed de his conſule quæ infra capite XII tradam.

Singulis autem obſervationibus quæ actæ fuerant antequam egomet agere, ac ſeriem hanc concinnare inciperem, auctor eſt adſcriptus unde eas deprompſi, adjectis præterea ſi quæ ille de aeris ſtatu, aut de obſervationis ſive certitu-

titudine, ſive dubietate notaſſet. Neque tamen exiſtimandum ſingulas ab iis habitas e quorum libris, aut chartis exſcriptæ ſunt, cum & illi ſæpe ab aliis acceptas memorent, & interdum accepiſſe potuerint etiamſi non memorent. Hi porro partim eas obſervationes in operibus a ſe editis vulgarunt, veluti Caſſinus in ſpecimine obſervationum anni 1656, Mengolus in anno, Ricciolius in aſtronomia reformata, ac alii alibi, de quibus nihil attinet dicere, cum libri illi omnium manibus terantur; partim adverſariis aut ſchedis mandatas reliquerunt, quorum ego ſcriptorum aliqua autographa inſpexi, alia ab autographis me curante deſumpta obtinui, ac ex omnibus ſeriem compegi; hæc vero ſcripta quæ fuerint, & a quibus acceperim hic recenſendum duxi. Sunt autem hæc:

Schedæ atque epiſtolæ plures apud *Joannem Dominicum Caſſinum*, quibus obſervationes multæ continebantur cum ab ipſo, tum ab aliis, præſertim Auguſtino Fabrio, ac Geminiano Montanario habitæ. Haſce omnes Caſſino ipſo conſulto mihi eſt impertitus anno 1704 ſummus dum vixit Aſtronomus Jacobus Philippus Maraldus, ejus ſororis filius, cujus præſertim conſuetudini quæ multa mihi cum illo, partim coram, partim per literas interceſſit, acceptum fero ſi quid in aſtronomicarum obſervationum uſu profeci.

Auguſtini Fabrii ſcripta autographa, quæ Albertus Comes Graſſius Bononiæ Senator ab illius hæredibus ſibi tradita mecum communicavit anno 1699. Libellus erat in quo dietim obſervationes notabat & calculos longitudinis Solis ſubducebat, ac præterea ſchedæ duæ, altera manu Fabrii, altera cujus neſcio. Ex hiſce omnibus quæcumque ad rem meam erant excerpſi. Fuerat Fabrius Caſſini, dum Bononiæ doceret, auditor, eumque in obſervationibus adjuverat.

Geminiani Montanarii libellus autographus inſcriptus: *1673 calculi obſervationum Solis hinc ad præteritos annos ex heliometro Divi Petronii*. Libellum hunc anno 1705 per Virum celeberrimum Franciſcum Blanchinum a Maria Piſana Corraria Matrona Veneta exſcribendum obtinui, quippe quæ ſcripta omnia, Montanario vita functo, in domo Corrariæ gentis ab ipſo relicta ſervabat.

Obſervationes aſtronomicæ a *Petro Mengolo* partim per ſe partim per ſocios adjutoreſve habitæ, a Julio Cæſare Calcina, qui in iis erat, e ſchedis inter obſervandum exaratis deſumptæ, ac in ordinem digeſtæ, mihique ab eodem dono traditæ circiter annum 1703.

Dominici Gulielmini adverſaria, libellis quatuor comprehenſa, necnon chartæ aliquot quotidianarum ejuſdem ſupputationum loci Solis ex obſervationibus, in libellos alios compactæ. Horum omnium autographa ipſa inſpicienda mihi tradidit, ac deſcribendi copiam fecit anno 1713 Joſeph Ferdinandus Gulielminus, Dominici filius, nunc Bononienſis gymnaſii anatomicus.

Faſciculus obſervationum poſt lineæ meridianæ reſtaurationem a Caſſino, Gulielmino, aliiſve habitarum, una cum computis declinationum Solis, quos *Ignatius Uccellus*, qui ædilium magiſtratui a tabulis conficiendis erat, in dies ſingulos ſubducebat, interdum & ipſe vel ſolus, vel cum illis obſervans. Has mihi chartas dono ipſe dedit anno 1710.

Alber-

Alberti Comitis Graſſii Bononiæ Senatoris pagellæ obſervationum ab ipſo mihi impertitæ anno *1699*. Eas obſervationes ut plurimum cum Gulielmino habuerat.

Hæc quidem de obſervationibus ante illud tempus habitis quo ipſe eas quæ haberentur ſervare inſtitui; proximo enim anno quam Caſſinus inſtrumentum reſtituit, anno videlicet *1696*, cum ad hæc ſtudia animum adjeciſſem, primum Gulielmini obſervationibus frequens adeſſe, dein illo Patavium evocato ipſemet peragere, atque in ſeriem referre cæpi. Quod cum ad plures annos præſtitiſſem, neque vero perpetuo id agere poſſem, aliorum ſubinde opera uſus ſum, ac quantum in me erat curavi ne unquam certus homo deeſſet, qui id ſibi negotii datum exiſtimaret, mihique obſervationes quas habuiſſet traderet. Hi vero qui fuerint nunc ſubjiciam.

Victorius Franciſcus Stancarius analyſeos profeſſor publicus, hic cum adoleſcens aſtronomiæ ſtudio ſe addixiſſet ex anno *1697* tangentes in hac meridiana linea primum cum Gulielmino, deinde mecum notare cæpit, ac quoties adeſſe non poſſem meas ipſe vices ſupplere; Tanta enim mecum illi conjunctio erat ut neuter quicquam ſibi actum in hiſce ſtudiis putaret quin alteri commune eſſet. Ejus opuſcula mathematica ac obſervationes nonnullas, mecum ac cum fratribus meis habitas edidi anno 1713. Objerat ipſe in ætatis flore anno 1709.

Gabriel Manfredius frater, nunc & ipſe publicus analyſeos profeſſor, tum vero adoleſcens admodum, nobiſcum obſervabat, quouſque anno 1703 Romam eſt profectus. Deinde anno 1706 reverſus maximam partem earum obſervationum peregit, quæ inde ad annum 1708 in hac ſerie recenſentur.

Heraclitus Manfredius frater Medicinæ Doctor, nunc matheſeos lector honorarius, cum Stancario ac Gabriele fratre ad annum 1708 ſæpe obſervavit, aut eorum abſentium vices egit.

Antonius Leprottus nunc Clementis XII Pont. Max. archiater ſæpe cum Stancario ac Manfrediis fratribus, deinde ſolus obſervationes habuit, præſertim anno 1708.

Julius Cæſar Pariſius Aſtronomiæ ſtudioſus mihique in publico obſervatorio adjutor deſignatus, circiter annum 1710 me curante obſervare cæpit ac inde ad annum 1714 proſecutus eſt.

Paulus Balbus Medicinæ Doctor nunc Bononienſis gymnaſii anatomicus cum Pariſio primum deinde ſolus annis 1714 & 1715 rogatu meo obſervationes egit.

Joſeph Antonius Nadius Philoſophiæ Doctor Pariſio ſuffectus ut me in publico obſervatorio adjuvaret tangentes identidem notabat anno 1717 aliiſque ſuccedentibus ad 1722, quo ipſo anno obiit dum obſervatorium ædificaretur.

Joannes Baptiſta Banderius J. U. Doctor a me rogatus anno 1722 huic rei vacare cæpit atque ad annum 1724 perrexit. Obiit anno 1726 cum vix adoleſcentia exceſſiſſet.

Joannes Jacobus Parma Philoſ. Doctor ex anno 1724 ad 1730 obſervationes poſt Banderium eſt proſecutus. Proximo inde anno conſtanti adhuc ætate vita functus eſt.

Anno 1731 *Joſephum Roverſium*, juvenem mathematicis ſtudiis addictum rogavi uti obſervationes per æquinoctia ſaltem ac ſolſtitia ſibi agendas reciperet, quod deinceps præſtitit.

Anno 1733 *Andræas Celſius* Regius in Vpſalienſi gymnaſio aſtronomus, ac ſcientiarum academiæ nuper ibi erectæ a ſecretis, Bononiæ cum moraretur ex die 13 Octobris quotidie cum per tempeſtatem liceret Solem ad Divi Petronii obſervare inſtituit ad uſque diem 8 Aprilis 1734, quo die Bononia diſceſſit. Eas obſervationes mihi perhumaniter eſt impertitus cum reliquis recenſendas.

Illo autem profecto *Roverſius* iterum id ſibi muneris ſuſcepit, quo etiamnum diligenter fungitur, ejus interdum vices ſubeunte *Euſtachio Zanotto* Philoſophiæ Doctore, qui meus nunc in publico obſervatorio adjutor eſt.

Præter eos quos hactenus enumeravi nonnulli quandoque alii Solem hoc inſtrumento obſervarunt, quorum nomina ſuis quæque diebus appoſui. Arbitror autem a Caſſiniana reſtauratione vel nullam, vel paucas peractas fuiſſe obſervationes quæ ad me non pervenerint, & in hanc ſeriem relatæ non fuerint, ſi aliquot excipias circiter annos 1716 ac 1717 habitas, quarum ſchedulæ perierunt. Ante annum vero 1695 fieri poteſt ut aliquæ ſint quæ me undique inveſtigantem effugerint, opinor tamen haud multæ.

CAPUT VII.

De hujuſce inſtrumenti examine per Mengolum habito.

NUnc vero cum obſervationum certitudo non minus ab aſtronomi ſolertia quam ab exacta inſtrumenti conſtitutione pendeat, inſtrumenta autem omnia atque adeo gnomones ipſos, utcumque firmis ædificiis ſubnixos, ac initio affabre elaboratos, exiguis interdum motionibus depravari poſſe compertum ſit, poſtulat inſtituti mei ratio ut quæ quibus temporibus vitii ſuſpiciones in gnomone hoc noſtro obortæ ſint, tum vero quæ iis vitiis detegendis examina ſint peracta, quave ratione inſtrumentum redintegratum, ordine referam; ne qui obſervationes haſce præ manibus habituri ſunt quid de ſingularum fide ſtatuendum ſit ignorent, ſed ad ſua quaſque tempora referentes iis cum delectu utantur.

Ac primum ſciendum eſt lineam hanc meridianam non antea fuiſſe marmoream, & ad aquæ ſuperficiem libratam quam circiter æſtivum ſolſtitium anni 1656, id quod mihi a Caſſino acceptum Maraldus ſignificavit. Cum enim ante annos 30 ac eo amplius inſtrumenti hujuſce hiſtoriam concinnare aggreſſus eſſem, jam inde ab eo tempore de omnibus quæcumque huc pertinerent, neque libris mandata reperirem, Caſſinum ipſum adhuc ſuperſtitem vel egomet per literas conſului, vel per Maraldum, qui cum frequentior mihi erat literarum conſuetudo rogavi. Neque tamen idcirco minus certæ habendæ ſunt obſervationes illæ, quæ a prima lineæ deſcriptione, ſolſtitio videli-

cet

cet anni 1655 ad marmorum collocationem peractæ fuerant, toto enim eo temporis ſpatio canalis aqua plenus lateritiis aggeribus contentus ſecundum lineæ ductum protenſus jacuit, ac quoties Solaris imaginis limbi in lateribus notarentur, toties notæ illæ ad aquæ ſuperficiem, ac per eam ad perpendiculi punctum exigebantur. Una fuit obſervatio quæ correctione indiguerit, quæ nempe omnium prima inter opus ipſum deſcribendæ lineæ acta fuerat, cum ſcilicet linea nondum ad perpendiculi modum exquiſite commenſa eſſe poſſet; hanc vero obſervationem poſtmodum a ſe correctam Caſſinus Ricciolio tradidit, a quo eam deſumpſimus, atque in ſeriem hanc retulimus.

Primus quod ſciam de inſtrumenti vitio vulgatus eſt rumor anno 1669, aut 1670, cum Caſſinus in Galliam eſſet profectus. Suſpicioni anſam præbuerunt haud obſcura luxatæ ipſius ſacrarum ædium compaginis indicia, cum tranſverſariæ catenæ ferreæ, quibus medianæ navis fornices colligantur minime rigidæ atque intentæ, quemadmodum poſitæ initio fuerant, ſed manifeſto incurvæ viſerentur, cujuſmodi in hunc diem viſuntur. Ejus rei mentionem injecit celebris hujuſce gymnaſii mathematicus Petrus Mengolus pagina 25 ejus opuſculi, quod *de refractionibus ac parallaxibus Solis* Bononiæ edidit anno 1670, quo ipſo anno perpendiculum die 14 Julii ex centro foraminis demiſſum nonnihil ad occaſum declinaſſe, ita tamen ut regulæ ferreæ craſſitudinem non excederet, teſtatur Fabrius in libello M. S. obſervationum, huicque experimento adfuiſſe Montanarium, atque ipſum Mengolum ſuperveniſſe ait, nuſpiam tamen perpendiculi altitudinem menſuris tentatam memorat.

Ceterum longe prolixius rem hanc proſecutus eſt Mengolus libro alio quem *annum* inſcripſit, ac triennio poſt evulgavit, ubi pag. 258 gnomonis depravationem jam non conjecturis tantum conceptam, ſed menſuris una cum Franciſco Doctore Monario Centenſi actis ſibi deprehenſam, exploratamque teſtatur. Ligneam enim catenam (regulam nempe e regulis pluribus junctam) ita gracilem ut laxe per foramen tranſmitti poſſet, ex puncto verticali ad perpendiculum erexit, ac per foramen trajectæ ipſam foraminis aciem impreſſit, quo perpendiculi longitudinem adamuſſim comprehenderet, mox in pavimento reclinatam meridianæ lineæ applicuit, illud præcavens ut catena utroque poſitu maxima qua poſſet vi traheretur; eoque experimento perpendiculi altitudinem a centeſima lineæ diviſione particulis 45 deficere comperit, propterea que particularum eſſe 99955 haud amplius; Itaque tangentibus omnibus diſtantiarum a vertice, quæ hoc inſtrumento captarentur augmentum ea proportione tribuendum eſſe ſtatuit, quæ eſt 99955 ad 45. Ad hæc marmorum eorum quæ orientalem lineæ regulam compingunt, quæque ad duas perpendiculi centeſimas dimenſa fuiſſe diximus, ſingillatim poſitiones exquiſivit, ac nonnullorum ex iis initia meridionalia aliquot particulis a juſto poſitu aberrare agnovit; hæc nimirum quæ ſubjecimus:

Cen-

Centeſimæ perpendiculi in marmoribus notatæ	*Poſitus initii meridionalis lapidis contigui menſuris deprehenſus.*
94	94005
106	106005
162	161995
232	232010
234	234010
236	236010
238	238010
240	240010
242	242010
244	244010
246	246010
248	248010
250	250020

quæ tamen animadverſio nihili eſt, non enim Caſſinus initia meridionalia lapidum deinceps ſubſequentium, ſed (ſi forte commiſſuræ hiarent) extrema borealia præcedentium, quibus ipſis extremis centeſimæ adſcriptæ ſunt, attendi, & tanquam centeſimarum terminos ſpectari voluerat, cum ſcilicet regula ferrea nondum inciſuris diſtincta eſſet, quas poſtmodum, anno ſcilicet 1695 adjectas fuiſſe diximus.

Sed ad perpendiculum ut revertar, vitium illud particularum 45 minime ex recenti ob ædificii luxationem obrepſiſſe ſtatuit Mengolus (pag. 6) ſed initio, cum inſtrumentum ipſum exſtrueretur, contractum eſt arbitratus. Multorum enim teſtimonio ſibi compertum ait qualiacumque illa commotarum teſtudinum argumenta non modo ante meridianæ lineæ deſcriptionem animadverſa, verum & antea ab architectis proviſum ne id malum longius procederet; ad hæc omnem illam motus ſuſpicionem de novo opere conceptam, gnomonem vero in antiquo collocatum, cui nulla eſſet cauſa quamobrem loco cedere, ac ſubſidere debuerit.

Denique (pag. 258.) inſtrumentum jam inde ab anno 1655 corruptum ex obſervatione quadam Solis confirmat, quam obſervationem affert Ricciolius aſtronom. refor. libro primo capite 8 pag. 26. Die enim 8 Auguſti ejus anni ipſe cum Grimaldo meridianam altitudinem centri Solis ad Divæ Luciæ captavit grad. 61. 41. 29, eam vero ad Divi Petronii fuiſſe ait 61. 41. 0.; quod ita accipiendum apparet ut hic captata fuerit gr. 61. 40. 50, ſed ad Divæ Luciæ parallelum ab ipſo Ricciolio redacta augmento ſecundorum 10 (quæ parallelorum eſt differentia) ac propterea diſtantiam a vertice ad Divi Petronii fuiſſe gr. 28. 19. 10, indeque centri Solaris tangentem ibi obſervatam arguit Mengolus 53888. Huic porro particularum 6 correctionem addendam eſſe ex eo colligit quod aliis per id tempus notatis tangentibus particulas 5 aut 10 Caſſinus ipſe adjecerit (eam ſcilicet obſervationem indicat die 21 Junii 1655 habitam, quam unam poſtmodum a Caſſino correctam diximus) inde ergo fieri tangentem veriorem ex obſervatione in Divi Petronii 53894, atque ideo cen-

centri a vertice diſtantiam (apparentem ſcilicet) gr. 28. 19. 20, altitudinem vero 61. 40. 40, quæ ad Divæ Luciæ foret 61. 40. 50, cum tamen a Grimaldo & Ricciolio obſervata fuerit 61. 41. 29; quæ diſcrepantia defectum perpendiculi particularum ipſarum 45 mirifice illi comprobat; ut enim tangens veræ altitudinis gr. 61. 41. 29 nempe 185653 ad tangentem gr. 61. 40. 50, puta 185569, ita partes 100000 ad eam longitudinem perpendiculi ex qua angulus ille 61. 40. 50 deductus eſt, quæ propterea longitudo partium erit 99955, deficiens a 100000 partibus ipſis 45. Hac ergo de cauſſa omnes, quotquot in eo libro memorat, obſervationes a prima inſtrumenti conſtructione habitas ea quam diximus ratione corrigit, neque aliter quem correctas uſui eſſe poſſe contendit.

Mihi vero (ut a poſtrema hac Mengoli probatione incipiam, qua perpendiculi defectum illum partium 45 ad primam gnomonis conſtructionem referre conatur) mirari ſubit tantum geometram quantus omnium opinione ac maximo merito ſuo habitus eſt Mengolus, non animadvertiſſe ex obſervatione illa quam affert contrarium plane effici, atque ipſe vult. Eſto enim tangens centri Solis eo die in Divi Petronii gnomone notata AB (*Figura* 4.) foraminis centrum C, perpendiculum AC, radius e centro Solis per foraminis centrum directus CB. Quantacumque ergo fuerit eo tempore perpendiculi longitudo AC, certiſſimum eſt veram centri Solis a vertice diſtantiam (ſi modo refractiones ac parallaxes, quod ille fecit, ſeponamus) fuiſſe angulum ACB, ac veram ejus altitudinem ABC. Jam ſi perpendiculum a partibus 100000 (quod ipſe contendit) deficiebat quantitate aliqua, veluti CD, perſpicuum eſt obſervatorem, qui ejus rei inſcius angulos diſtantiæ a vertice atque altitudinis ex tangente AB in canone trigonometrico ſupputavit, quaſi radius ex altitudine 100000 promanaſſet, inventurum fuiſſe pro angulo ACB angulum ADB, pro angulo autem ABC angulum ABD, minorem ſcilicet diſtantiam a vertice, ac majorem altitudinem. Atqui in obſervatione per Mengolum allata oppoſitum plane accidit, altitudo enim in Divi Petronii ex tangente illa (utlibet correcta) inventa dicitur graduum 61. 40. 40; quæ ſane vel ſi decem ſecundis augeatur ob locorum diſcrimen, veram tamen altitudinem (a Ricciolio videlicet ad Divæ Luciæ definitam) adeo non excedit, ut ſecundis 39 ab ea deficiat. Tam longe ergo a vero abeſt ea obſervatione evinci perpendiculum jam inde ab anno 1655 juſto fuiſſe brevius particulis 45, ut potius, ſi ex illa judicium ferendum ſit, tantumdem juſto longius prodeat. Sed videlicet minime æquum eſt ex unius obſervatiunculæ fide inſtrumenti tam exſquiſito ſtudio confecti fidem in dubium revocari, cum vel alteruter, vel uterque obſervator exiguum quiddam errare potuerit; ac ſane neque illius obſervationis ad Divi Petronii actæ auctorem Ricciolius memorat, neque, quod ſolet, tangentium ipſarum numeros conſignat, e quibus fallacia, ſi qua irrepſerat, detegi fortaſſe poſſet, neque vero egomet dum haſce obſervationes colligerem eos numeros uſpiam nanciſci potui, ut propterea neceſſe ſit ignorari & a quo, & quam diligenter habita obſervatio fuerit.

Sed hæc quidem eo pertinent ut appareat quam nullo fundamento Mengoli ſuſpicio nitatur de gnomonis altitudine perperam initio conſtituta. Ex hoc

por-

porro conſequitur defectum illum perpendiculi a Mengolo menſuris ſuis taxatum partium 45, ſi modo ullus erat, depreſſæ potius poſt inſtrumenti fabricam templi teſtudini tribuendum. Sed eum nullum revera fuiſſe facit ut abſque Mengoli injuria dubitare liceat examen gnomonis aliud per id temporis a Montanario habitum, de quo proximo capite dicam.

Caput VIII.

De examine alio quod a Montanario eſt habitum.

QUam ſolerter atque accurate hujuſce inſtrumenti ſtatum expenderit Geminianus Montanarius, egregius in Bononienſi Schola mathematum profeſſor, haud melius declarare me poſſe arbitror quam ſi ejus ad Caſſinum epiſtolam, cujus exemplum a Maraldo accepi, e vernaculo idiomate quo ſcripta eſt, verſam hic ſubjungam. Data eſt Bononiæ die 8. Februarii 1673.

Ut primum accepi literas tuas animum ad ea adjeci quæ maxime neceſſaria arbitratus ſum uti hanc meridianam lineam adverſus Zoilos hoſce vindicarem; cujus rei oblata eſt occaſio cum vir nobilis Franciſcus Andreæ Neapolitanus, celebris in ea urbe juriſconſultus, idemque omni literarum genere ornatus, Romæ, Florentiæ, ac tota Italia notiſſimus, Bononiæ degeret, ubi ad menſem eſt diverſatus. Primum ergo privatim cum Auguſtino Fabrio, ac cum adoleſcente quodam, qui curatoribus ædis Divi Petronii a rationibus ſcribendis eſt (is adoleſcens intima familiaritate Mengolo eſt conjunctus, ac cum ipſe viſurus quæ agerentur ſponte ſe nobis inſinuaſſet, non renuimus, quando præſertim nil agi poterat quin ipſe reſciſſet) cum hiſce ergo perpendiculum, catena e regulis ligneis nexa dimenſi ſumus, ejuſque altitudinem quam exactiſſimam invenimus, tametſi nonnulli vulgaverant Mengolum ejuſmodi catena uſum diſſidium in eo inveniſſe partium 40. Ubi ſummum hunc conſenſum perſpexi, Senatores plures, alioſque amicos aut horum ſtudiorum curioſos viros invitavi, in quibus Franciſcum illum Andreæ, qui Auzouto valde amicus eſt, ac coram his fabulam, quod ajunt, apparatu ſcenico egi, iis omnibus peractis quæ ſubnexa epiſtolæ huic narratio continet, quam narrationem non ſtatim ad te miſi, quod nondum libramenta ſupputaſſem, neque ſcriptum ipſum abſolviſſem. Ceterum inter experimentum ipſum capiendum ſingulis qui aderant omnium quæ agerentur cognoſcendorum poteſtatem feci, nec quicquam in ſcriptum retuli quin antea adſtantes omnes elata voce interpellaſſem res ne ita eſſet; quapropter narro tibi: experimentum hoc & pluribus os occluſit, & inter Senatores, atque adeo inter omnes rumorem virtuti tuæ valde ſecundum excitavit. Nunc ad concinnandum opuſculum quoddam materiam præparo. In eo opuſculo fabricam Gnomonis, ejuſque uſum, examen ac defenſionem necnon obſervationes eo habitas complecti cogito. Titulus erit ferme ejuſmodi: Bononienſis meridiana, ſeu Caſſinianus Gnomon in Divi Petronii æde Bononiæ erectus, a G.M. deſcriptus explicatus expenſus ac vindicatus, adjectis.

jectis.... centuriis obſervationum eo actarum &c. *Habes ex titulo quæ mihi abs te ſuppeditari opus ferat, præſertim de inſtrumenti uſu. Illud inter cetera ſuccurrit ut paulo explicatius doceas de obſervatione tua circa telluris ambitum iſthic habita. Ad hæc cum de poli altitudinibus agere cogitem, quas altitudines Monarius ſingulis annis alias eſſe vult, atque ex eo eclipticæ mutationes explicat, quam cum Ricciolio immobilem ponit, velim obſervationem Uranoburgi habitam tuaſque de illa meditationes ad me mittas tum vero quæcumque potes alia de re hac univerſa; quamquam eſt ſane unde horum ſententia labefactetur ex variata tropicorum diſtantia, quæ vel ſi poli altitudo mutetur maximam nihilominus declinationem mutari oſtendit. Item de his quæ ad apogæum attinent, quod in operibus tuis an immotum ſit dubitare te ſignificas &c.* Narratio autem cujus in epiſtola meminit eſt hujuſcemodi.

Anno 1673. Januarii 30 ſubſequenti veſpera in Divi Petronii Bononiæ, præſentibus Achille Volta, Angelo Michaele Vaſtavillano Antonio Bovio Senatoribus, necnon Comite Valerio Zano, Andræa Bovio, Doc. Uliſſe Gozzadino, Abate .... Graſſio, Doctore Franciſco Andreæ, Auguſtino Pinchiario Bononienſis Provinciæ a litibus judicandis, Paride Maria Grimaldo, Doctore Caſpare Linder, ... Sega, Doctore Manzio, Archipresbytero Victorio, Doctore Marcello Malpighio, Doctore Auguſtino Fabrio, aliiſque plurimis.

Doctor Geminianus Montanarius ut gnomonis, a clariſſimo viro Jo: Dominico Caſſino in ea æde conſtructi ſtatum recognoſceret primum ex centro foraminis gnomonis, quod eſt in teſtudine navis orientalis filum demiſit, ac de eo ferreum globum ſuſpendit unciarum circiter 13 ſemis pondo, cui globo adferruminata erat cuſpis deorſum ad perpendiculum ſpectans ut in ſchemate (Fig.5.); globo autem poſt plures circuitus atque oſcillationes ad quietem redacto, manifeſto apparuit centrum gravitatis globi innuere ipſum initium lineæ meridianæ ad duas tertias craſſitudinis regulæ ferreæ occidentem verſus, ac propterea a medio regulæ ſexta haud amplius ejus craſſitudinis parte declinare, quod nullius eſt momenti.

Poſthæc catenam e pluribus regulis ligneis inter ſe ſe confixis, ac circa juncturas diductilibus compactam ad foramen uſque attollendam ut ejus laminam tangeret, eoque loco ſiſtendam ac firmiter alligandam curavit. Dehinc catena ſibi relicta ut libere penderet, eaque nonnihil vibrata, atque attracta, ad duas horas exſpectatum quo in juncturis probe diſtenderetur. Tum vero agnitum eſt catenæ longitudinem minorem eſſe altitudine perpendiculi, quod a lamina ad punctum illud in pavimento pertinet, quanta eſt craſſitudo julii argentei, ac ſemioboli ærei, quæ altitudinis totius partes ſunt centeſimæ milleſimæ haud amplius novem; itaque explorata laminæ craſſitudine, eaque inventa partium 6, ac dimidio novem illis partibus adjecto, fiebat defectus catenæ a gnomonis perpendiculo partium omnino duodecim. Demiſſa igitur catena eaque ſecundum meridianam lineam extenſa ac valide attracta, ut tenſionem eandem ſervaret, quam ſuſpenſa habuerat; primum animadverſum eſt cum ad ejuſmodi ſtatum redacta foret, quantacumque deinceps vi traheretur non plus in longitudinem diſtendi poſſe quam craſſitudine numi argentei capitati (ut teſtone *) ac cum iterum ſibi relinqueretur ad priorem dimenſionem reverti. In eo itaque ſtatu qui ipſi naturalis eſt non ſine omnium admiratione patuit illam particulis adamuſſim duodecim (hoc eſt ſumma ex julio argenteo, ſemiobolo*

æreo, & dimidia laminæ craſſitudine) deficere, quominus quinquaginta lapidum, ad duas perpendiculi centeſimas dimenſorum, longitudinem æquaret; id quod omnibus quotquot aderant ſuis oculis intueri, ac utrumque catenæ caput diligenter quantum vellent una recognoſcere licuit; nec quiſquam fuit quin hunc tantum dimenſionum conſenſum ſummopere admiraretur, cum inſtrumentum ante annos 17 conſtructum ne ad julii quidem argentei craſſitudinem vitiatum cerneret.

Pergit poſthæc Montanarius & meridianæ lineæ librationem eadem nocte a ſe peractam, dum catena de foramine penderet deſcribit, quo opere defectus aut exceſſus ſecundum altitudinem punctorum aliquot lineæ a perpendiculi puncto deprehendit, eos tamen non valde notabiles, quemadmodum in tabella hic ſubjecta apparet, cui & correctiunculas adjeci diſtantiis a vertice ea ex cauſa adhibendas; reliqua vero lineæ puncta præter hæc recte omnia habere comperit aut certe a recto aberrare minus una particula quod ad obſervationes nihil eſt.

Centeſimæ altitudinis perpendiculi in linea meridiana.	*Libramenti vitium.*	*Correctio adhibenda diſtantiis a vertice.*
	Particulæ.	*ſec.*
60	6 alt.	6 ad.
66	4 alt.	3 ad.
80	5 depr.	4 ſub.
106	13 depr.	14 ſub.
114	13 depr.	14 ſub.
126	9 depr.	9 ſub.
138	7 depr.	7 ſub.
148	7 depr.	6 ſub.
156	2 depr.	2 ſub.
176	2 depr.	2 ſub.
182	14 depr.	12 ſub.
190	9 depr.	8 ſub.
200	1 alt.	1 ad
212	3 alt.	2 ad.
224	6 depr.	5 ſub.
232	6 depr.	5 ſub.
250	6 depr.	4 ſub.

Sciendum eſt autem librationem hanc in regula meridianæ ferrea a Montanario peractam non in marmoreis, ſecus atque egomet opinatus eram, atque adeo ſcripto mandaveram in enarratione poſtremi examinis hujuſce inſtrumenti a me habiti anno 1722, quæ enarratio extat in commentariis Bononienſis ſcientiarum inſtituti ante annos aliquot editis. Ex eo fieri poteſt ut correctiunculæ diſtantiarum a vertice, quas in hac tabella tradidi minime exactiſſimæ ſint; verum de hoc infra agam quum poſtremum illud inſtrumenti examen hic denuo referam.

Ceterum quod perpendiculi longitudinem ex medio craſſitudinis laminæ, in qua foramen eſt, Montanarius deſumpſerit, quaſi in medio illo plano foramen ejuſque centrum ſpectandum eſſet, neſcio quam recte factum; nam quantum ex Caſſini diſſertatione anno 1695 de hoc inſtrumento edita colligo (pag. 9.) planum ipſum foraminis neque in medio craſſitudinis laminæ, neque uti nunc, in infimo ejus plano, ſed in ſupremo poſitum fuerat, ubi conica illa apertura in anguſtum deſinebat. Verum hæc differentia nonniſi particulis tribus perpendiculi longitudinem majorem efficit, quam quæ a Montanario ſumpta fuit, quod parvi eſt momenti.

Jam vero quid de duabus hiſce inter ſe ſe tam aperte pugnantibus Mengoli ac

ac Montanarii dimenſionibus ſtatuendum eſſet diu anceps hæſi, quod neutri clariſſimorum virorum fidem adhibere poſſem quin alterius aut dexteritati, aut ſolertiæ, aut etiam fidei detraherem; neque hæc ſane dubitatio modicum ad obſervationum uſum momentum habebat, cum alterius examen perpendiculum particulis 45 juſto brevius oſtendat (id quod ſcrupuli unius primi cum triente in diſtantia Solis a vertice differentiam inducere quandoque poteſt) alterius vero nihil quicquam deficere, quinimo (ſi quæ paulo antea dixi attendantur) particulis tribus abundare evincat; neque vero hæc a temporum diverſitate conciliari poterant, cum Montanarii experimentum, quemadmodum ejus literæ teſtantur, poſt Mengoli dimenſiones ſumptum fuerit, niſi forte exiſtimamus perpendiculum eo temporis intervallo in priſtinum juſtumque poſitum nullius ope ſe ſe reſtituere potuiſſe.

Sane ut Mengolo aſſentirer facere videbatur Caſſini ipſius teſtimonium, qui inſtrumenti hujuſce viciſſitudines in ea quam ſæpe memoravi hiſtoria (pag. 17) enumerans, perpendiculi depreſſionem a Mengolo & Monario annis 15 poſt gnomonem conſtructum inventam, ac particulis 45 taxatam, ſubinde vero foraminis laminam non ante annum 1689 a Gulielmino reſtitutam memorat, de Montanarii vero examine anno 1673 habito nihil memorat. Cum ergo ea res animi ſuſpenſum me haberet, Caſſinum uti ſolebam anno 1704 per Maraldum de eo rogavi, Maraldus hæc reſpondit: *Quæ Caſſinus in tractatu de meridiana iſta linea ſcripſit pag. 17 & 18 circa gnomonis altitudinem, particulis 45 immutatam, ex Mengoli & Monarii relatu ſcripſit, quem certum arbitrabatur, neque tunc illi ſuccurrit memoriæ Montanarii ad ipſum epiſtola anni 1673. Ex hac liquet Montanarium ſummo ſtudio ac coram pluribus viris præcipuis eam altitudinem expendiſſe, & exactam comperiſſe. Montanarii experimentum nonniſi poſt illud tempus ſumptum eſt quo tempore Mengolus ea de inſtrumenti vitio per civitatem vulgaverat, quæ deinde libro ſuo inſeruit. Epiſtolam Montanarii ad Caſſinum hic habes.*

Manifeſtum eſt igitur nihil momenti ad Mengoli aſſertionem a Caſſini auctoritate accedere poſſe, quando Caſſinus in ea re Mengoli ipſius auctoritatem eſt ſequutus. Neque vero mirum cum tanto temporis intervallo illam gnomonis ſui hiſtoriam conſcriberet, aliqua illi excidiſſe, quæ ad rerum potius geſtarum tempora diſtinguenda, quam ad ipſarum veritatem cognoſcendam attinerent. Vere enim dixit vitium in perpendiculo inventum, hocque a Guglielmino reſtitutum, ſed cum Montanarii examen memoriæ tunc illi non obverſaretur, vitium illud ad Mengoli tempora retulit, quod tamen nonniſi poſt aliquot annos contrahi potuit, & demum a Gulielmino deprehendi. Et vero nullum ejuſmodi vitium fuiſſe anno 1673, quin etiam circiter annum 1679, obſervationibus ipſis inter ſe ſe collatis (quando certior ratio occurrebat nulla) eviciſſe me arbitror, quemadmodum inferius oſtendam; jam enim experimentorum hiſtoriam proſequor, & ad Gulielmini tempora pergo.

Caput IX.

De gnomone per Gulielminum expenſo, ac reſtituto.

EVolventi mihi obſervationes omnes hoc heliometro a Montanarii examine deinceps habitas quaſcumque vel autographas reperi, vel ab aliis deſcriptas accepi nihil ad plures inde annos invenire contigit quod ullam de inſtrumenti labe ſuſpicionem ab iis qui obſervationes agerent conceptam ſignificaret. Neque ex eorum tantum ſilentio conjecturam feci, quæ fallax eſſe poterat, ſed ex aſtronomicis calculis qui multi in iis autographis occurrunt, quique dietim ad exquirendam Solis longitudinem ſubducebantur, manifeſto perſpexi quam firma illis eſſet de recto gnomonis ſtatu perſuaſio, cum nullam tangentibus obſervatis correctionem uſpiam adhibitam invenirem (ſi eam quæ a foraminis diametro pendet excipiamus) quæ tamen neceſſario aliqua adhibenda fuerat ſi inſtrumentum corruptum, ac præſertim foramen particulis illis 45 a Mengolo definitis collapſum opinarentur.

Prima mihi vitiati gnomonis occurrit mentio ad diem 8 Julii 1684 in adverſariis Dominici Gulielmini, inſignis in Bononienſi gymnaſio mathematici, perpetua mihi memoria recolendi, quod meus in hiſce ſtudiis inſtitutor fuerit. An autem menſuris ab ſe actis id deprehenderit, an alia quapiam ratione conjecerit certo affirmare non poſſum, nulla enim nota diei illi adſcripta eſt alia niſi hæc: *S: P: guaſta* ſcilicet: *in meridiana Sancti Petronii depravata;* facile tamen inducor ut exiſtimem Gulielminum ab obſervationibus ipſis, quas per eos dies habebat edoctum inſtrumenti corruptelam agnoviſſe, illæ etenim a Caſſiniana Solis longitudine (cui aliæ antea habitæ quamproxime reſpondere conſueverant) magis diſſident quam ut poſſit ſive obſervandi fallaciis, ſive computi quo longitudo inquiritur elementis imputari.

Eo autem certius de hac re judicium ferre potuit Gulielminus quod alius illi id temporis gnomon præſto eſſet, quo Solem iiſdem diebus vel ipſe vel per ſocios obſervans inſtrumenta inter ſe ſe conferret. Etenim jam inde ab anno 1674 in ædibus patriciæ gentis Vaſſæorum a Petramellaria meridianam aliam lineam Caſſinianæ ſimilem licet perpendiculo longe breviori aptatam duxerat Montanarius, quam Jo: Antonius Vaſſæus Senator eleganti opere marmoreo atque æreo exornaverat. Erat præterea in illis ædibus horologium oſcillatorium, & quadrantale inſtrumentum ſideribus obſervandis, & aſtronomica ſupellex alia. Ejus rei gratia Montanarius ipſe, Mengolus, Gulielminus ſæpe illuc accedere, nocturnas etiam obſervationes Lunæ aut ſtellarum inſtituere, præſertim vero meridie tangentes limborum Solis ex ea linea notare conſueverant, quarum obſervationum aliquot in eorum adverſariis aut ſchedis inde deſcriptis inveni; eas in primis quæ eo ipſo menſe Julio anni 1684 actæ fuerant, quum magna Solis eclipſis immineret. Sunt autem tangentes correctæ diei 6 Julii eo gnomone 40615, & 39580, e quibus diſtantia centri Solis a vertice

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ex refractionibus & parallaxibus Caſſinianis emendata ſit gr. 21. 51. 17, quæ porro ex tangentibus eodem die ad Divi Petronii notatis colligitur gr. 21. 52. 11, quemadmodum infra in earum ſerie apparet; unde longitudinem Solis elicuit Gulielminus gnomone Vaſſæano grad. 15. 1. 57 Cancri, nempe unico ſcrupulo majorem Caſſiniano Mezzavacchæ computo grad. 15. 0. 36, cum ex tangentibus ad D. Petronii obſervatis prodeat decem fere ſcrupulis major nempe gr. 15. 10. 1, atque eadem præterpropter diſcrimina exiſtunt e ſuccedentium dierum obſervationibus. Hoc ergo, opinor, indicio Gulielminus gnomoni qui ad D. Petronii eſt, aliquam illatam labem ſenſit, ac notam illam diei 8 Julii adſcripſit.

Quo autem vitii genere inſtrumentum id temporis depravatum eſſet, aut quampridem illi id quodcumque erat corruptelæ accidiſſet, facit obſervationum paucitas ut & inveſtigatu ſit difficile, & tamen minus neceſſarium. Equidem veroſimile mihi fit haud unam errorum fuiſſe cauſam, nec tantum in foraminis lamina ſed & in linea ipſa quærendam, dum perpetuo hujuſce attritu alii lapides ſenſim deprimerentur, alii fortaſſe exſilirent, neque eum ſervarent poſitum quo ſinguli ad aquæ ſuperficiei libramentum exacti fuerant, quod malum a Montanario jam anno 1673 in regula ferrea, uti diximus deprehenſum, ac forte temporis decurſu auctum, obſervatoribus perſpectum eſſe potuit, licet non ante annum 1684 adnotatum. Plane poſt annum 1676 obſervationes hoc gnomone ad 1679 perraræ ſunt, inde vero ad 1684 prorſus nullæ, ac rurſum ingens inde eſt lacuna ad annum uſque 1690, cum tamen toto eo tempore plures ad Vaſſæorum gnomonem habitas fuiſſe appareat, quaſi ejus qui ad Divi Petronii eſt uſum, ob ſuſpectam ejus fidem paulatim intermiſiſſent.

Utcumque ſit, minime dubium eſſe poteſt quin anno 1689 centrum foraminis a perpendiculo per initium meridianæ lineæ ducto nonnihil detortum, atque una depreſſum foret, quando id ſibi perſpectum, ac propterea laminæ reſtituendæ negotium ab ædilium magiſtratu ſibi demandatum fuiſſe, idque eodem anno effectum ſe dediſſe teſtatur Gulielminus in appendice ad Caſſini diſſertationem anno 1695 editam, pag. 38. Hoc tamen ita interpretari licet ut ſtatim quidem operi manum admoverit, ſed non ante proximum annum abſolverit. In ejus enim autographis ad diem 13 Aprilis 1690 *perpendiculum juſto brevius eſſe, ac fortaſſe laminam in qua foramen eſt, nonnihil ad auſtrum vergere* diſerte notat; ad diem vero 27 ejuſdem menſis *radium certiſſime breviorem, nec vero laminam horizontalem eſſe memorat*; Kalendis Juniis *centrum foraminis ſuo loco* (opinor in perpendiculi directione) *poſitum, ſed differentiam altitudinis cenſeri particularum decem;* poſtridie ejus diei *gnomonem quatuor particulis altiorem ait*; die 6 etiamnum talem eſſe confirmat, denique die 10 Junii in adverſariis: *gnomone*, inquit, *recte, ut videtur conſtituto*, & in libello alio in quo dietim computum ex obſervationibus inire ſolebat, quæ ad eum diem ſpectat actam ait *gnomone recte ſe habente quoad omnia*. Quibus omnibus manifeſtum fit Gulielminum per id temporis perpendiculo reſtituendo operatum, denique paulo ante diem 10 Junii 1690 ſupremam huic manum impoſuiſſe.

Etſi

Etſi vero ſublatum erat perpendiculi vitium, illam tamen quam dixi marmorum labem & agnoſcit, & etiamnum manſiſſe in ea appendice memorat, ac propterea correctione aliqua identidem opus fuiſſe ait, quo tangentium, quæ deinceps notatæ ſunt menſuræ ad idem cum perpendiculi puncto libramentum redigerentur; quarum ſane correctionum nulla certa tradi poteſt ratio, quod lapidum a recto poſitu deviationes aliis lineæ partibus aliæ, quibuſdam etiam nullæ eſſe poſſent; neque vero aliter quam librationibus exploratas arbitror ſi quando ad obſervationes corrigendas earum deviationum ratio eſt habita; neque ei incommodo occurſum eſt ante annum *1695*, quo Caſſinus in Italiam reverſus inſtrumentum ex integro inſtauravit, uti jam exponam.

Caput X.

De inſtrumento per Caſſinum redintegrato.

CUm ergo in eo ſtatu res eſſet accidit ut Caſſinus in itinere quod e regia academia Pariſienſi, obſervationes aſtronomicas per Italiam habiturus ſuſceperat anno *1694* Bononiam, ex annorum ſex & viginti intervallo repeteret. Ubi in hanc urbem venit nihil illi fuit antiquius quam præclarum hocce artis ſuæ monumentum inviſere deque ejus ſtatu cognoſcere. Opportune factum ut quo tempore Sevirorum Magiſtratus ejus reſtituendi cum neceſſitatem agnoverat, tum conſilium agitabat, Caſſinus ipſe & adeſſet, & nihil magis optaret. Illi ergo cura eſt demandata. Erat cum eo Jacobus ejus filius, magna tum ſpe adoleſcens, nunc (quod Pater ætate ſua fuit) aſtronomorum ætatis noſtræ facile princeps; ejus igitur ac Gulielmini auxilio ad opus eſt aggreſſus.

Primum ut inſtrumenti per illud tempus conſtitutionem agnoſceret, perpendiculi altitudinem expendit, invenitque foramen nonnihil iterum a Gulielmini reſtitutione collapſum, nempe (quantum ex nota conjicere licet, quam notam Gulielmini adverſariis ad Kalendas Februarias *1695* adſcriptam inveni) depreſſum particulis 40. Adhæc, Caſſino ipſo teſte, ejus foraminis centrum occaſum verſus detortum erat particulis 30, id quod indicio eſſe ait laterales teſtudines medianarum motui obſecundaſſe, quas in ſe ſe arctatas atque compreſſas e ferrearum catenarum eas colligantium curvatura arguit. Ad lineæ vero lapides quod attinet, qui illorum ſtatus inventus fuerit declarat Gulielmini nota alia, quam ex iiſdem adverſariis exſcriptam ſubjeci: *Die 21 Decembris* 1694 *D. Caſſinus expendit planum meridianæ lineæ, invenitque in locis ſolſtitiorum & æquinoctiorum in eadem libella cum ipſius lineæ initio, verum e regione columnarum deprimitur particulis* 31 *vel* 32 *perpendiculi, & paulo minus ad partem auſtralem columnæ borealis.* Jacobus quoque Caſſinus in itinere Italico (editum hoc eſt in 7. volumine monumentorum veterum Regiæ Pariſienſis academiæ anno *1729*) non aliam lineæ depravationem quam juxta co-

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lumnas illas inventam innuit. Caſſinus vero pater in reſtaurationis hiſtoria addit lapides eos, qui juxta columnas duas ſunt poſiti omnium fere maxime depreſſos fuiſſe, cum aliorum nonnulli etiam a poſitu priſtino elati exſtanteſque apparerent. Idipſum vitii, quod columnarum viciniam ſpectat, librationibus ſuis in ferrea regula deprehenderat Montanarius, ac particularum 13 vel 14 taxaverat, uti in tabella capite 8. tradita manifeſtum eſt, columnarum etenim altera ad centeſimas præterpropter 106 & 114, altera juxta 182 incidit, quibus locis maximam ille depreſſionem invenerat; unde argui poſſe videtur pavimentum columnarum atque adeo teſtudinum pondere prægravatum ſenſim ſubſediſſe.

His compertis, quando opus a certo aliquo horizontali plano ex arbitrio ſtatuendo, ac meridianæ lineæ deſtinando inchoandum erat, ſatius duxit Caſſinus infimum illum poſitum eligi, quem præterpropter lineam juxta columnas teſtudinum pondere depreſſam accepiſſe invenerat, lapideſque omnes reliquos eouſque deprimi, ne ſi linea altior collocaretur majus periculum eſſet ne loco iterum cederet. In eo igitur poſitu infimo lapides ſingulos marmoreæ utriuſque regulæ, ad aquæ conſiſtentis ſuperficiem libratos ſtatuit, ac quo firmiores eſſent lateribus minime ſtratis, ſed rectis gemino ordine poſitis hinc inde ſtipandos curavit, illud præſertim cavens ut neque lineæ directio quicquam immutaretur, & ſingula lapidum extrema juſtam a perpendiculi puncto, lineæque initio diſtantiam, adſcriptis numeris indicatam ſervarent; priſtinam enim ab eo initio ad centrum foraminis perpendiculi menſuram, atque adeo & centeſimarum dimenſiones ipſiſſimas retineri placuit. Addit Gulielminus poſt lapides in horizontalem ſitum compoſitos ferream quoque regulam ipſis coæquatam, quod ita accipiendum eſt ut quoad ejus fieri poſſet curatum fuerit; non enim regula illa marmorum plano examuſſim tota æquari poterat, quod ſuperficiem minime ut marmora lævem & expolitam habeat, ſed nonnihil ſinuatam, licet hoc ob exiguas, ac fere inſenſiles devexitates ægre oculis diſtingui poſſit. Præſertim vero cautum fuiſſe arbitror ut ipſum regulæ ferreæ initium, a quo perpendiculum ſurſum ad centrum foraminis erigendum erat in eodem cum marmoribus horizontis plano exacte ſtatueretur.

Ubi linea reſtituta eſt, foraminis planum tanto inferius ab antiquo poſitu ſtatui oportuit, quanto lineæ ipſius planum depreſſum fuerat, quo priſtina perpendiculi altitudo ſervaretur. Foramen ergo in nova lamina excavatum eſt, figura uti diximus conica, anguſtiori parte deorſum ſpectante, qua parte ejus diameter centeſimas milleſimas particulas centum comprehendit. Tum vero e regulæ ferreæ initio erecta regula alia lignea e tribus aſſerculis compacta, ac lamellis duabus orichalcicis ab imo, & ſummo inſtructa, cujus regulæ longitudo centum partes ipſas primas ex linea comprehenderet, eouſque depreſſa eſt lamina ut inferiori ſui plano ſuperius regulæ caput tangeret. Denique demiſſo e centro foraminis perpendiculo lamina horizontali motu eo adducta eſt unde perpendiculi directio in ipſum caput regulæ ferreæ, ejuſque craſſitudinis medium incideret; id autem vaſe cubico aqua pleno exploratum, cujus baſeos centrum initio lineæ congruebat, perpendiculum enim in aqua exceptum poſtquam ab oſcillando conquieſceret per plani ſuperioris centrum,

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ſilorum duorum ex angulis intentorum interſectione deſignatum, dirigi apparuit. In eo demum poſitu lamina helicibus eſt obfirmata. Horum omnium peragendorum rationem, atque artificium univerſum accurate Gulielminus deſcripſit in appendice illa cujus ſæpe memini, ubi & inſtrumenta ſingula in hoc opus adhibita iconibus expreſſa viſuntur. Ea inſtrumenta ipſa in hoſce uſus ſervari ab ædilibus ſcitum eſt.

Denique ne qua deinceps in menſuris tangentium ex hac linea promendis ambiguitas oriretur, quod regularum marmorearum, præſertim orientalis, lapides aliqui temporis decurſu attriti, atque exeſi terminos haud ſatis definitos haberent, regulam ipſam ferream ad ſingulas altitudinis centeſimas inciſuris diſcriminandam curavit, novamque laminam ad caput lineæ ubi nunc extat ſtatuendam, qua lamina partes altitudinis centeſimæ milleſimæ non ut antea denæ, ſed ſingulæ dignoſci poſſent; utrumque exſquiſita arte effectum.

Ceterum cum ea ætate celebris inter geographos agitaretur quæſtio an terreſtrium meridianorum certa eſſet ac conſtans directio, an vero, quod nonnulli ex antiquarum obſervationum cum recentioribus collatione ſuſpicabantur, aliis temporibus alia, periculum illi facere lubuit de hac linea num annorum quadraginta, qui a prima ejus deſcriptione effluxerant, intervallo quidpiam a cæleſti meridiano declinaſſet. Cum ergo ineunte anno 1695 Januario menſe ac Februario matutinas aliquot Solis altitudines, ac promeridianas totidem iis reſpondentes captaſſet, atque ex earum temporibus horologio oſcillatorio notatis ipſum meridiei tempus elicuiſſet (correctiuncula non neglecta quam Solaris motus obliquitas per eos dies poſtularet) tempus hoc cum eo tempore contulit, quo ſingulis illis diebus ex appulſu Solaris ſpeciei ad lineam, ejuſque inde exceſſu, ſpeciem ipſam a linea biſſectam fuiſſe arguerat; neque uſquam diſſidium reperit quod unum vel alterum ſcrupulum ſecundum excederet, propterea lineam meridiano adhuc mire congruere agnovit.

Univerſæ porro reſtitutionis hujuſce opus ſub æquinoctium vernum anni 1695 abſolutum eſſe Gulielmini autographa declarant; ad diem enim 19 Martii adſcriptum eſt in adverſariis *poſt reaptationem perfectam gnomonis D. Petronii*, & in libello ſupputationum diurnalium Solis: *reſtituto gnomone Divi Petronii per D. Joannem Dominicum Caſſinum prima obſervatio fuit die 19 Martii 1695*. Etſi enim in adverſariis ad diem 23 Junii notat lapidem illum in quo tangens limbi inferioris excepta eſt, juſto depreſſius eſſe particulis 7, id tamen caſu aliquo lapidi huic poſtmodum accidiſſe arbitror perfecto jam opere, neque ejuſmodi ſuſpicionem ad reliquos pertinere.

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Caput XI.

De poſtremo inſtrumenti examine quod anno 1722 *eſt habitum.*

QUæcumque mihi de hoc inſtrumento deinceps enarranda reſtant, jam non ex aliorum ſcriptis, ſed e propria memoria meiſque pagellis repetenda erunt. Cum enim inter hanc ſeriem ordinandam obliquitatem eclipticæ ac poli altitudinem e ſolſtitialibus obſervationibus quotannis exquirere cæpiſſem, utramque autem neque antiquioribus obſervationibus hac linea habitis exacte reſpondere, nec vero ſingulis annis ſibi conſtare manifeſto perſpexiſſem, de obliquitate quidem eclipticæ minus mirabar, quod eam multorum aſtronomorum ſententia mutabilem eſſe noſſem, de poli autem altitudine quid ſtatuerem hærebam, majora enim mihi videbantur diſſidia quam ut obſervandi fallaciis tribui poſſent, & porro conſtans quædam in ea inconſtantia ratio faciebat ut ne refractionum quidem viciſſitudinibus id adſcriberem, ſed, quod unum reliquum erat, inſtrumentum aliquid denuo vitii feciſſe ſuſpicarer. Id vero præſertim animo mihi inſederat ex anno *1699* quo per menſem Auguſtum ac Septembris initium noveram templi concamerationem architectorum ſuaſu in angulis teſtudinum ab incumbis ſuperius materia oppletam, quo latera firmiora eſſent, inde enim fieri potuiſſe conijciebam ut in teſtudinibus atque adeo in foramine Solem admittente commotio aliqua contigiſſet. Suſpicionem auxerunt anno 1702 obſervationes Romæ interea habitæ gnomone alio permagno ac celebri, quem ſummi aſtronomi Franciſcus Blanchinus ac Jacobus Philippus Maraldus proximo ante anno, Clementis XI. P.M. auctoritate ad thermas Diocletiani ſtatuerant, quarum obſervationum numeros ubi cum Bononienſibus conferrem differentias diſtantiarum Solis a vertice minime eaſdem nanciſcebar, ſed aliis anni diebus alias; quod illuc pertinebat ut præter perpendiculi labem libramentum etiam Bononienſis lineæ alicubi luxatum eſſe poſſet.

Cum ea res multos annos anxium me habuiſſet, ut denique mihi ſcrupulum hunc evellerem anno 1722 menſe Junio gnomonem iterum ipſemet expendere volui, facta ejus rei ab Ædilium magiſtratu poteſtate, ac omnibus ſuppeditatis inſtrumentis, quæ a Caſſiniana reſtauratione penes eos ſervabantur. Examini adfuerunt, atque adeo operam contulerunt viri ſtudiorum omnium, ac matheſeos in primis laude præſtantiſſimi Antonius Leprottus, nunc Summi Pontificis Clem. XII Medicus, Jacobus Bartholomeus Beccarius Bononienſis gymnaſii anatomicus, Franciſcus Zanottus philoſophiæ in eodem gymnaſio profeſſor, nunc & ſcientiarum inſtituto a ſecretis, Joſeph Antonius Nadius mihi in publico obſervatorio adjutor deſignatus, Joannes Jacobus Parma, Joannes Baptiſta Banderius, Joſeph Bolſius Marcheſius, Dominicus V Veber, Carolus Hebert Monachus Hieronymianus, aliique nonnulli qui hujuſcemodi

ſtudiis delectabantur. Neque vero ejus examinis enarrationem hic repetam, quæ in commentariis inſtituti ſcientiarum ante annos aliquot vulgata extat, ſed tantum qui inſtrumenti compertus fuerit ſtatus ſummatim referam, ne pars hæc in ea quam tradimus mutationum ejus hiſtoria deſideretur, præſertim cum nonnulla mihi notanda ſint, quæ in illa enarratione non attigi; ſed poſt eam editam, rem totam recogitans animadverti.

Foraminis planum erat nonnihil ad horizontem obliquatum, ita tamen ut centrum ipſi initio lineæ ad perpendiculum reſponderet. Ea ergo obliquitas obſervationes nihil turbat, ſed tantum penumbræ latitudinem immutat diſcrimine vix perceptibili, quemadmodum ſubductis calculis compertum eſt.

Suſpenſa ex foramine regula illa eadem lignea, qua Caſſinus anno 1695 uſus fuerat, invenimus eam particulis 17 deficere quo minus ferreæ regulæ caput, unde meridiana linea incipit, ab imo attingeret, ubi extremum ſuperius regulæ ipſi foraminis centro aptaretur. Mox regula juxta ipſam lineam ita reclinata uti quam rectiſſime extenderetur, defectus fuit iterum partium 16 vel 17 ab initio lineæ ad inciſuram centeſimam, unde agnitum perpendiculi altitudinem eſſe ut oportet partium centummillium. Eadem longitudo a centeſima ad ducenteſimam inciſuram eſt inventa.

Inciſuræ ipſæ quinæ infixis in arundine ad eorum intervalla acubus exploratæ paribus adamuſſim ſpatiis diſſitæ deprehenſæ ſunt.

Denique regulæ ferreæ libratio peracta eſt ad binas quaslibet centeſimas; hoc vero opere plures a recto poſitu aberrationes in ea repertæ; cum aliis locis elata, aliis depreſſa eſſet, ubi cum perpendiculi puncto compararetur. Eas differentias ſingulas una cum correctionibus, diſtantiæ a vertice adhibendis, quæ correctiones erroribus illis ſingulis reſpondent, appoſita hic tabella complectitur. Ubi notandum æſtivo ſolſtitio Solis ſpeciem marginibus ſuis incidere in centeſimas 37, & 38, hyberno autem in centeſimas præterpropter 243, & 249, ac propterea ſi utroque loco facilitatis gratia centralis tantum tangentis ratio habeatur, eadem fere utrobique correctio diſtantiæ a vertice addenda conflatur ſecundorum 14, aut circiter, quod hic monuiſſe in rem erit

Cen-

Centeſima altitudinis perpēdiculi.	*Libramēti vitium.*	*Correctio adhibenda diſtantiæ a vertice.*	*Centeſima altitudinis perpēdiculi.*	*Libramēti vitium.*	*Correctio adhibenda diſtantiæ a vertice.*	*Centeſima altitudinis perpēdiculi.*	*Libramēti vitium.*	*Correctio adhibenda diſtantiæ a vertice.*
	Part.	*ſec.*		*Part.*	*ſec.*		*Part.*	*ſec.*
36	20 alt.	13 ad.	112	10 depr.	10 ſub.	188	0	0
38	22	14	114	5	5	190	2 alt.	2 ad.
40	24	18	116	0	0	192	7	6
42	29	21	118	3	3	194	7	6
44	36	28	120	3	3	196	12	10
46	36 alt.	29 ad.	122	2 alt.	2 ad.	198	8 alt.	6 ad.
48	30	23	124	5 depr.	5 ſub.	200	4	3
50	32	27	126	4	4	202	5	4
52	40	34	128	0	0	204	3	2
54	41	35	130	4 alt.	4 ad.	206	3 depr.	2 ſub.
56	40 alt.	35 ad.	132	7 alt.	7 ad.	208	2 alt.	2 ad.
58	32	30	134	4	3	210	5	4
60	28	27	136	1	1	212	2	2
62	25	23	138	2	2	214	9	7
64	21	19	140	7	7	216	14	11
66	19 alt.	19 ad.	142	20 alt.	19 ad.	218	22 alt.	17 ad.
68	15	14	144	32	31	220	22	17
70	12	11	146	37	36	222	19	15
72	10	9	148	27	26	224	14	11
74	8	8	150	20	19	226	7	5
76	17 alt.	17 ad.	152	12	12 ad.	228	7 alt.	5 ad.
78	15	15	154	7	7	230	7	5
80	20	20	156	5 depr.	5 ſub.	232	7	5
82	24	24	158	17	16	234	3	2
84	22	22	160	25	23	236	1	1
86	24 alt.	24 ad.	162	12 depr.	11 ſub.	238	8 alt.	6 ad.
88	25	25	164	4 alt.	4 ad.	240	15	11
90	29	29	166	11	10	242	23	16
92	25	26	168	12	11	244	19	14
94	29	29	170	17	16	246	17	12
96	19 alt.	19 ad.	172	16 alt.	14 ad.	248	19 alt.	14 ad.
98	12	13	174	10	9	250	2	1
100	15	16	176	2 depr.	2 ſub.			
102	7	7	178	6	5			
104	5	5	180	7	6			
106	2 alt.	2 ad.	182	5 depr.	4 ſub.			
108	0	0	184	4 alt.	3 ad.			
110	12 depr.	12 ſub.	186	1 depr.	1 ſub.			

Hæ quidem ſunt libramenti depravationes quas in linea ferrea invenimus, quibus ſi adſcriptæ in tabella correctiones adhibeantur, diſtantias a vertice ab omni

omni inſtrumenti vitio purgaras inde ei ci poſſe ſum arbitratus. Verum cum deinde rem hanc univerſam mecum ipſe reputarem, ac Caſſinianam enarrationem paulo attentius legerem, pœnituit me in eo examine quod tanto ſtudio inſtituiſſem aliquid omiſiſſe quod nonnihil denuo ſcrupuli mihi nunc ingereret. Non enim Caſſinus ſive cum inſtrumentum primo conſtrueret, ſive cum anno 1695 reſtitueret, ferream lineam, ſed marmoreas ad eandem cum puncto perpendiculi altitudinem exegerat, licet (quod me fefellit) hoc ipſum punctum, ſive lineæ ipſius initium, ad caput ferreæ regulæ, ac in ejus latitudinis medio ſtatuiſſet. Ac quamvis Gulielminus in ea reſtauratione regulam ferream, poſt marmorum librationem peractam, ad eorum uſque planum depreſſam fuiſſe tradat, fieri tamen nequit ut regula illa cum marmoribus exacte complanata fuerit, quæ ipſa minime plana ſit, ſed ſuperficiem nonnihil inæqualem criſpatamque habeat. Accedit quod cum regula e ſegmentis pluribus ferreis conſtet, quæ ſingula cuſpidibus in pavimento confixa, ac cum marmoribus calce coagmentata, nec ſine aliqua vi in eo poſitu detenta fuiſſe arbitror, fieri poſſit ut proprio denique niſu ſe ſe reſtituens exiluerit, lapidibus tamen vel nihil vel minus commotis, eaque de cauſa ubique fere juſto elatior inventa fuerit, quin etiam nonnullis locis oculorum ipſorum teſtimonio a marmoribus extans appareat, idque mihi rem hanc haud ſatis perpendenti luxatorum marmorum ſpecie impoſuiſſe.

Etſi ergo correctiones in ſuperiori tabella traditas haud valde a vero abludere crediderim, vereor tamen ut exactiſſimæ ſint; non enim cum obſervationes habemus ſpeciei margines in ipſa regula ferrea, ubi ex atro metalli colore minus nitidi apparent, ſed ut plurimum in marmoreis, ubi termini manifeſtiores ſunt, cultello notamus ac ibi lineolam margines ipſos tangentem ducimus, licet hanc deinde notam ad ferri inciſuras referamus. Marmoreæ vero regulæ an & quantum a perpendiculi libramento aberrent, hoc eſt quod a me omiſſum doleo. In ipſo certe lineæ initio, ac perpendiculi puncto ferream regulam marmoreis complanatam a me inventam & memini, & ex eo fit manifeſtum quod etiamnum idem cum illis planum ſervet. Quæ vero aliis lineæ locis marmorum conſtitutio eſſet divinare nequeo.

Hæc de experimento illo dicenda habui, ne quis ei quam ſupra memoravi enarrationi a me tum conſcriptæ confiſus menſuris noſtris plus æquo tribuat. Ex eo autem tempore ad hunc quem agimus annum 1734 nullam de gnomonis ſtatu menſuram egi, non enim ejuſmodi tentamenta ſæpius iterare licet, quæ ſine magno molimine capi non poſſunt. Equidem ob haſce mihi obortas ſuſpiciones ex die 21 Aprilis 1723 iis qui deinceps tangentes meridie notarent inculcavi, ut in ipſa regula ferrea potius quam in marmoreis ſpeciei margines definirent, quo ſcilicet correctiones ſuperiore anno inventæ utiles eſſe poſſent; ſed neque id perpetuo ab illis ſervatum opinor, nec vero tam facile factu eſt, quod margines ægre in ferro diſtinguantur; ut taceam curam hanc ſupervacuam reddi ſi, quod accidiſſe poteſt, ab eo tempore regulæ libramentum iterum immutatum fuerit.

Antequam hoc caput claudam prætereundum non duxi directionem quoque meridianæ lineæ a nobis expenſam, ac rectiſſime habere compertum. Equidem

dem nonnulla de eo experimenta cœpimus eo ipſo anno 1722 dum libramenta ceteraſque dimenſiones ageremus, ſed cum mihi in eo non ſatisfeciſſem, alias experiendum ſum arbitratus. Hoc ergo anno 1734 die 3 Aprilis in publico obſervatorio meridiem per altitudines antemeridianas, ac pomeridianas Solis accuratiſſime determinavimus, ac porro editis ex Divi Petronii ſignis indicanda nobis curavimus momenta duo temporis, quibus momentis ſpecies Solis meridianam illam & primo attingeret, & ultimo deſereret, illudque ſummo ſtudio cavimus ne quid temporis inter edenda ſigna deperderetur, quod ſenſu percipi poſſet; ac cum obſervatorii meridianum a Divi Petronii æde ſecundis temporariis præterpropter duobus in ortum vergere ſat certo nobis perſpectum eſſet, ejus quoque diſcriminis rationem habuimus, ſubductiſque calculis comperimus meridiem ex linea illa vix ſecundo horario juſto citius indicatum. Denique die 12 Novembris iterum periculum fecimus, ac meridiem ſecundo horario ſerius in linea quam in cælo deprehendimus. Ex hiſce ergo obſervationibus quæ in punctis lineæ adeo inter ſe diſſitis actæ ſunt manifeſto evincitur rectiſſimum eſſe ejus poſitum, ipſique cæleſti meridiano, quantum poterat accuratiſſime aptatum; quod idem Caſſinus anno 1695 ab experimentis ſuis invenerat.

CAPUT XII.

Quo delectu hujuſce ſeriei obſervationes uſurpandæ, & quatenus corrigendæ ob inſtrumenti vitia.

NOnnemo fortaſſe mirabitur me qui hujuſce gnomonis hiſtoriam ſummatim tantum attingere ſuſceperim, in ejus erroribus enarrandis tam multum fuiſſe, nec modo vitiis ſed & vitiorum ſuſpicionibus recenſendis tamdiu immoratum. Qui tamen ſecum reputaverit quantum ad obſervationum uſum momenti habeat de inſtrumentorum conſtitutione certo cognoſcere adeo non mirabitur, ut aliquid præterea de hac re a me addi expectet, ne videlicet in ſingulis hujuſce ſeriei obſervationibus hærere ac ſuperiora capita percurrere opus habeat, uti ſciat quæ earum integro inſtrumento actæ ſint, quæ vero in ſuſpecta tempora incidant, ac correctione quapiam indigeant. Horum igitur expectationi paucis hoc capite ſatisfaciam.

Primum igitur obſervationes ex anno 1655 ad exitum ſaltem Januarii 1673 nulla ſuſpicione laborare oſtendit Montanarii examen, niſi forte earum aliquæ in ea lineæ loca incidant in quibus ipſe anno 1673 libramentum regulæ ferreæ nonnihil immutatum invenit, quæ loca capite 8 in tabella recenſuimus, ac correctionem ejuſmodi obſervationibus adhibendam tradidimus; ſed ea & pauca ſunt, & minimum quiddam vitiata, & de vitii initio nihil liquet, nec denique ea ſuſpicio ad primos ſaltem poſt inſtrumenti conſtructionem annos pertinere videtur. Neque enim audiendum eſſe Mengolum quum ipſo initio perpendiculum juſto brevius effectum narrat, aut cum tangentibus ante marmorum

morum collocationem particularum quinque, aut decem augmentum tribuendum hariolatur manifeſto evicimus capite ſeptimo. Sed neque eſt ut perpendiculum medio ſaltem eo tempore particulis ut ille contendit 45 decurtatum vereamur, ſi enim hoc ita eſſet diſtantiam tropici Cancri a vertice ſecundis 30, tropici autem Capricorni ſecundis 31 apparenter imminutam fuiſſe oporteret, cum tamen illa ad annum ſaltem 1663 potius aucta fuerit, deinde paullulum, ac longe minus ſecundis 30 imminuta, hæc vero ad annum 1669 vix quicquam mutata; quemadmodum ex obſervationum ſolſtitialium ſerie infra tradenda apparebit. Neve hæ ipſæ ob aliquod lapidum vitium ſuſpectæ haberi poſſint, ea marmora in locis ſolſtitiorum ad annum uſque 1694 juſtum ſervaſſe poſitum Caſſinus deprehendit, uti dictum capite 10; quibus omnibus penſitatis, vel ſi Montanarii examen deficeret, Mengolum tamen in menſura illa agenda deceptum fuiſſe minime dubitarem.

Poſt menſem vero Januarium anni 1673 ad Martium 1679 etſi nullum experimentum captum eſt, quod de inſtrumenti ſtatu docere poſſit, contra nullam eſſe cauſam quamobrem perpendiculum depravatum putemus oſtendit poſtrema obſervatio diei 19 Martii 1679, quæ cum prope æquinoctium cadat, quo loco lineæ lapides ad annum 1695 nihil quicquam immutatos ſupra diximus, niſi perpendiculum quoque recte habuiſſet, ſuperiorum annorum obſervationibus, quæ ſcilicet ante annum 1673 eodem die 19 Martii peractæ fuerant, reſpondere haud poterat, quibus tamen ita reſpondit, ut accuratius nequeat. Cum enim anno 1657 diſtantia centri Solis a vertice fuiſſet gr. 44. 45. 51, eademque anno 1670 inventa foret gr. 44. 49. 45, apparet eam diſtantiam tredecim annorum ſpatio (quorum annorum tres tantum intercalares fuerunt) auctam fuiſſe ſcrupulis 3. 54. Atqui idem augmentum fere ad unguem inventum eſt ex anno 1666 ad 1679, pari ſcilicet annorum intervallo, & intercalarium numero; fuit enim anno 1666 grad. 44. 50. 13, anno autem 1679 gr. 44. 54. 6, diſcrimine iterum minutorum 3. ſec. 53. Conſenſus hic plane mirus explicari ſane nequit ſi perpendiculum vel tantillum ab anno 1673 corruptum ponamus. Reliquum ergo eſt ut hiſce annis de lineæ plano ambigi poſſit; ac ſane ſi qui lapides jam inde a Montanarii examine collapſi erant, cum nemo eos reſtituerit, proclive eſt ut potius exiſtimemus in deterius lapſos, ac forte vitium ad alios propagatum; ſed cum de hoc nil certo ſtatui poſſit, unum ſupereſt ut ejus temporis obſervationibus tanquam minus certis utamur, niſi ſi quæ circa æquinoctia, aut ſolſtitia peractæ ſunt, ubi marmora ſuis locis ad annum 1695 manſiſſe diximus.

Multo vehementior de illis obſervationibus eſt ſuſpicio quæ poſt annum 1679 ad diem 10 Junii 1690 in ſerie recenſentur, quod tunc depravatio plani cum aliqua perpendiculi labe conjuncta fuiſſe videatur; id quod de primis ſaltem anni 1690 ratum faciunt adſcriptæ illis Gulielmini notæ; propterea minime illis fidendum. Verum eæ perpaucæ ſunt.

Reſtituto autem die 10 Junii 1690 per Gulielminum perpendiculo, quamquam illud a ſuo poſitu iterum deſciviſſe conſtet, de tempore autem non conſtet, faciunt tamen obſervationes autumnali æquinoctio ejuſdem anni habitæ ut ſaltem ad id temporis nihil mutatum arbitrer. Die enim 23 Septembris diſtan-

ſtantia centri Solis a vertice obſervata eſt grad. 44. 48. 48, die vero eodem anni *1695*, inſtrumento per Caſſinum jam redintegrato, fuit ea diſtantia gr. 44. 43. 24., intervallum eſt annorum 5, quorum unicus intercalaris. Rurſum autem anno 1700 recurrente die 23 Septembris diſtantia fuit gr. 44. 38. 10, ubi intervallum eſt iterum annorum 5. cum unico biſſextili (ob diem ſcilicet anno 1700 ad Gregorii XIII præſcriptum expunctum) decrementum vero diſtantiæ a vertice min. 5. 14, quod priori illi decremento min. 5. 24 haud male reſpondet. Sed & ſolſtitium hybernum anni *1691* haud valde aberrare videtur, neque vero hæc contingere potuiſſent ſi perpendiculum minus recte habuiſſet. Verum ſi obſervationes illas prope æquinoctia, & ſolſtitia excipias, reliquis per id tempus habitis, ob plani depravationem vitium ſubeſſe poteſt (ac multo magis aliis quæ poſt annum *1691* ad diem *19* Martii *1695* peractæ fuerunt) ſed eorum vitiorum corrigendorum nulla eſt ratio.

Ex die ergo *19* Martii *1695* quo Caſſiniana reſtauratio abſoluta fuit nihil eſt quod deinceps de perpendiculi vitiis ſimus ſolliciti ſaltem ad menſem Junium anni 1722, quo menſe illud recte habere comperi. Ad lineæ vero libramentum quod attinet, iis equidem tangentibus quæ ipſo anno 1722, aut etiam ante aliquid temporis, notatæ fuerunt correctio adhibenda eſt ex tabella, quam ſuperiori capite attuli, ita enim niſi exactiſſimas a vertice diſtantias nacti fuerimus, ſaltem vero propiores aſſequemur quam ſi correctio illa negligatur; verum cum liquere non poſſit quampridem ante annum 1722 depravatio acciderit, ac veroſimile ſit eam paulatim ac aliis lineæ partibus citius, aliis ſerius ſupervenîſſe, tutiſſima ratio eſt ſi primis a reſtauratione annis, nulla correctione utamur, eorumque annorum obſervationibus magis fidamus quam quæ poſtmodum ſunt habitæ; in illis enim vix eſt ut vereamur planum lineæ tam ſubito labefactatum, præſertim cum in ejus redintegratione cautum eſſet ne lapides facile loco cederent.

Poſt examen illud anni 1722 cur perpendiculum immutatum arbitrer nulla eſt cauſa, cum nil ab eo tempore obſervationibus præſertim ſolſtitialibus (quæ omnium ad hæc vitia exploranda ſunt aptiſſimæ) accidiſſe videam quod & integro gnomone accidere non conſueviſſet. Id autem confirmari videtur a progreſſu obſervationum iiſdem anni diebus habitarum, ac pari annorum numero inter ſe ſe diſtantium ante ac poſt annum 1722, uti in exemplo quod hic ſubjeci; ubi tamen notandum diem 25 Januarii *1698* ſubſequenti ſæculo minime diei 25 ſed *26* Januarii reſpondiſſe, ob intercalarem ſcilicet diem anno 1700 omiſſum

		Diſtantia centri Solis a vertice ex obſervatione G ′ ″	*Diminutio diſtantiæ a vertice annis* 12 ′ ″
1698	25 Januarii	*63*. 15. 40	
			1. 25
1710	*26* Januarii	*63*. 14. 15	
			1. 25
1722	*26* Januarii	*63*. 12. 50	
			1. 27
1734	*26* Januarii	*63*. 11. 23	

haſce obſervationes conſulto elegi ad rem hanc confirmandam, tum quod tria ſint continentia annorum duodecim intervalla, quod rarum eſt, tum quod in

ea

ea loca meridianæ lineæ incidant quibus anno 1722 vix quicquam vitii in libramento irrepſerat. Manifeſtum eſt autem ſi foramen Solem admittens poſt eum annum a recto poſitu deflexiſſet differentiam illam duodenis antea annis bis eandem repertam min. 1. 25 deinceps eandem redire non potuiſſe. An autem libramenta lapidum, ſaltem aliquorum, aut regulæ ferreæ (in qua ipſa ex die 21 Aprilis 1723 tangentes interdum notatæ ſunt) poſt ultimum illud examen novis iterum luxationibus obnoxia fuerint, nihil certo affirmare poſſum, ſed haud multum errari arbitror ſi poſt annum etiam 1722 in hunc diem correctio de ſuperioris capitis tabella adhibeatur.

Hæc mihi ſingula pro temporum diverſitate diſtinguenda atque enucleanda fuerunt, eorum præſertim gratia qui ſummam, uti decet, in obſervationibus hujuſmodi ſubtilitatem ſpectant. Qui vero iis pinguiori ut ajunt Minerva habitis contenti ſunt, ſatis habebunt ſi ſcient vix ullam in hac ſerie tota inventum iri, quæ ſolidi ſcrupuli primi exceſſu vel defectu laboret, ſi modo ea tantum vitia ſpectemus quæ ob perverſam inſtrumenti conſtitutionem contrahi potuerunt; quæ enim ab obſervandi fallaciis oriuntur hic non moror.

Caput XIII.

Qui harum obſervationum uſus fuerit in refractionibus aſtronomicis conſtituendis.

Reliquum nunc eſt ut ad eam hiſtoriæ meæ partem tranſeam quæ obſervationum hoc gnomone habitarum in re aſtronomica utilitatem, maximis cæleſtis diſciplinæ acceſſionibus atque incrementis comprobatam complectitur; qua in re non vereor ne qui hæc legent me argumento quod exornandum ſuſcepi plus æquo tribuiſſe exiſtiment; nihil enim afferam niſi quod indubiis ac etiamnum publice extantibus horum octoginta annorum monumentis ratum teſtatumque ſit. Ordiar autem a refractionibus aſtronomicis ſine quibus nihil de vero ſiderum poſitu eorumve motu ſubtiliter ſtatui poterat. Refractiones equidem Ptolemæus ſubolfecit, Valtherus experimentis comperit, Tycho menſuris tentare cæpit, ſed Caſſinus obſervationibus hoc gnomone actis edoctus primus omnium a dioptricis principiis repetiit, ac in tabulas digeſſit.

Vix ille meridianam hanc lineam duxerat, necdum marmoribus conſtraverat, cum ſolares tabulas cogitare cæpit. Sed cum ab altitudine poli accurate determinanda ordiendum eſſet, neque dum ſatis obſervationum ex hoc inſtrumento haberet, quo ea de re decerneret; altitudinem illam per ſtellam polarem initio anni 1656 inveſtigavit. Erat ea ætate pleriſque omnibus aſtronomis perſuaſum nullam ſideribus refractionem contingere quæ ſenſu perciperetur, ubi ſidus ultra gradus 25, vel ut maxime 40 ab horizonte attolleretur. Itaque hac hypoteſi fretus, quæ inde a Tychonis temporibus promanaverat, eam quam invenerat poli altitudinem abſque ulla a refractionibus correctione retinendam arbitratus eſt, præſertim cum per idem tempus aſtronomi ſolertiſſimi

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Ricciolius, & Grimaldus ejuſdem ſtellæ obſervationibus eam ipſiſſimam loci latitudinem deduxiſſent. Celebris eſt hæc utraque obſervatio, quippe in eodem ſecundo ſcrupulo reſpondens; ſed de ea pluribus in loco dicam.

Hac ergo latitudine aſſumpta, cum jam anno 1655 æſtivo ſolſtitio (hyberno præ valetudine non licuerat) diſtantiam Solis a vertice meridianam obſervaſſet, ac ne hanc quidem ulla a refractionibus limitatione indigere ex communi aſtronomorum ſententia opinaretur, parallaxim vero Solis in tanta altitudine vix quicquam efficere certum haberet, prodiit illi diſtantia tropici æſtivi ab æquatore, ſive eclipticæ obliquitas; ex qua ſubinde longitudines Solis ſingulis diebus in linea obſervati ſupputans, ejus motus anomalias, ac celeritatum per anni tempora diſtributionem perſpexit, ac brevi ſolares tabulas adornavit, earumque tabularum ſpecimen edidit vere anni 1656, cum nondum annus a gnomonis conſtructione eſſet evolutus; quibus tabulis omnes Solis longitudines ſibi hactenus obſervatas accuratiſſime exhibebat. Verum poſtquam longitudines alias, quas a verno æquinoctio deinceps nactus fuit haud æque tabulis reſpondere comperit, perpendendum cenſuit an (quod erat ſuſpicatus) aliquid refractionis ultra gradum altitudinis 45 ſupereſſet, quæ neglecta & poli altitudinem, & eclipticæ obliquitatem, & longitudines ipſas quotidie calculis ſubductas vitiaſſet. Idipſum vero a ſolſtitiali obſervatione hyberna anni 1656 manifeſtius patuit, cum tropici diſtantia a vertice, utcumque e Tychonicis, aut Keplerianis, ſive Ricciolanis parallaxeon ac refractionum hypoteſibus expurgata, neque aſſumptam loci latitudinem, neque tropici a circulo æquinoctiali diſtantiam antea inventam reſtitueret.

Ea res neceſſitate quadam Caſſinum obſtrinxit ut in aſtronomicas refractiones paulo ſolertius quam hactenus factum erat inquireret, ac rem totam ab ipſis principiis ductam enuclearet. Multa enim de hoc refractionum negotio in aſtronomorum libris extabant, quæ limam poſcerent; veluti quod refractiones haud ſatis a parallaxibus extricaſſent, ac propterea in eadem apparenti altitudine aliam refractionem pro alia ſtellarum a centro telluris diſtantia conſtituiſſent; quod ſingularum refractiones ad certos tantum altitudinis fines protuliſſent, ac alia nonnulla neque ut videbatur rerum naturæ, neque ſibi ipſis conſentanea tradidiſſent. Ad rem igitur hanc explicandam nil aliud ſumpſit quam quod pleriſque omnibus philoſophis ſummo conſenſu receptum noverat, nimirum: craſſum aerem telluri ad certam diſtantiam circumfuſum eſſe, cujus aeris ſuperficiem ſphæricam ubi radius quiſpiam a cæleſtibus corporibus promanans oblique permearet, a directione ſua detorqueretur, ac interiorem aliam viam iniret, qua aerem ipſum recta trajiceret; tum vero illud: cujuſcumque e cælo radii in aeris ſuperficie refracti diſtantiam a centro telluris certa ſui parte decurtari. Poſtremum hoc in eam legem recidebat quam Carteſius de conſtanti ſinuum in refractionibus proportione haud multo ante vulgaverat, ac Caſſinus ipſe multiplici experimento in plurimis translucidis corporibus cum ſolidis, tum fluidis inſtituto, certiſſimam deprehenderat.

Ex hiſce principiis duobus rem univerſam confici poſſe cenſuit, modo & illius decurtationis ratio, & ſemidiametri ſphæræ aereæ in qua refractio contingit ad telluris ſemidiametrum proportio nota eſſet. Hanc vero utramque ex

datis duabus refractionibus, quæ altitudinibus duabus apparentibus reſponderent invenire aggreſſus eſt: arduum ſane problema cum ob geometricæ effectionis difficultatem, tum vero ob refractionum illarum quas prænoſci atque aſſumi oportebat incertitudinem, præſertim ſi eas in Sole ipſo inveſtigandas ſuſciperet, cujus parallaxis ea ætate incomperta, aliiſque aſtronomis aliter taxata, ita indaginem hanc omnem turbabat, ut in ea perſequenda nil tanquam certum exploratumque ſumi poſſe videretur. Neque enim Solis declinatio, neque poli altitudo, quibus arcubus (una cum angulo vel horarii, vel verticalis circuli cum meridiano) tanquam notis ad refractiones exquirendas aſtronomi utuntur, ſatis perſpectæ eſſe poterant, quod eorum arcuum hic refractione adhuc ignota, ille vero & parallaxi involvi poſſet; neque demum ubi vera altitudo ex calculis demum comperta foret, liquere poterat quantum illi parallaxeos nomine ſubduci oporteret, ut reſidui differentia ab obſervata altitudine refractioni adſcribi poſſet.

Verum cum ab aliis obſervationibus ipſi ſuboluiſſet Solis parallaxim permodicam eſſe, quæque infra ſcrupula ſecunda duodecim conſiſteret, id hypoteſeos loco ſumere non dubitavit, ac ſubinde ipſarum refractionum indaginem aggreſſus pluribus, ut credi par eſt, tentamentis, rem eo perduxit ut non aliter omnia inter ſe ſe cohærere ac conſpirare poſſe agnoverit, quam ſi altitudo ſuperficiei aereæ, in qua radiorum fit refractio poneretur *6095* earum partium, qualium telluris ſemidiameter 10000000, decurtatio autem diſtantiæ radii cujuslibet a centro terræ ex refractione orta fieret partium 2841 qualium diſtantia ipſa 10000000; his enim poſitis tales in unaquaque altitudine refractiones prodibant, ut & elevatio poli per ſtellam polarem inventa (quam ipſam elevationem a refractionum fallacia caſtigandam apparebat) eadem atque e ſolſtitiorum obſervationibus ſimiliter correctis eliceretur, & refractiones ipſæ ſolſtitiales meridianæ horizontali refractioni obſervationibus aliis ſibi exploratæ reſponderent.

Ac ne quid ſcrupuli ob neglectum in hac methodo diſcrimen opticæ refractionis ab aſtronomica ſuboriri poſſet, ex illis ipſis quas conſtituendas invenerat linearum proportionibus perſpicuum fiebat angulum illum quo radius aerem ſubintrans a recto tramite deflectitur, quique opticorum eſt refractio, aſtrononomicæ refractioni perpetuo æqualem eſſe, nempe angulo illi quem in oculo obſervatoris radius ipſe refractus cum ea linea comprehendit quæ inde ad ſtellam recta ducitur; quod ſcilicet tam modicus ſit ejus radii ad oculum uſque trajectus, ac obliqua adeo ad ſtellam poſitio, ut ne in Luna quidem, quæ omnium terris proxima volvitur, eorum angulorum differentia ſub ſenſum caderet; unde & illud denique efficiebatur refractiones a ſe inventas & Soli & Lunæ & Stellis omnibus tuto eaſdem adhiberi, ubi per radios refractos eadem altitudine ſpectarentur.

Ceterum ne de exigua illa quam aſſumpſerat Solaris parallaxeos quantitate diu ambigendum eſſet effecit haud multo poſt tum Caſſini ipſius cum aliorum Regiæ academiæ Pariſienſis aſtronomorum ſolertia. Horum enim obſervationibus quas anno 1672 in ſtella Martis inſtituerunt, comperta eſt parallaxis Solis in horizonte ſecundorum præterpropter decem; id quod Maraldus iteratis

anno

anno 1719 experimentis confirmavit, ac aſtronomi plerique omnes ratum deinceps habuerunt, aut certe tam parum ab ea determinatione diſceſſerunt ut perexiguum diſcrimen in refractiones inde manare poſſit. Propterea Caſſinus in præclaro illo commentario de elementis aſtronomicis ſuæ refractionum tabulæ eas parallaxes adſcripſit quæ decem ſecundorum parallaxi in horizonte reſponderent. Ex hac tabula eam deſumpſi quam ſupra tradidi capite quarto.

Ne quid omittam, illud quoque Caſſinus tentaverat ut in Kepleriana hypoteſi, quæ Soli parallaxim horizontalem minuti unius decernit, ſolſtitiorum ac polaris ſtellæ obſervationes conciliaret. Id autem minime ſuccedebat niſi refractio aliis anni tempeſtatibus alia poneretur. Itaque ex hac aſſumptione triplicem refractionum tabulam elicuit, æſtivam, æquinoctialem, & hyemalem, quæ ſi ſuis quæque temporibus uſurparentur, ac cum Kepleriana parallaxi componerentur, omnia iterum perbelle reſponderent. Rurſum enim elevatio poli tam e ſtella polari, quam e ſolſtitiis eadem prodibat, licet ab illa nonnihil diſſidens, quæ in priori hypoteſi inveniebatur, eclipticæ vero obliquitas, utra hypoteſis eligeretur nihil admodum variabat. Extat triplex illa tabula adjuncta ad Malvaſiæ ephemerides anno 1662 editas; ubi refractio quæ æſtiva nuncupatur eadem ad unguem eſt atque in priori hypoteſi. Adjecta ſunt præterea a Caſſino exempla aliquot quibus manifeſtum fieret elevationes poli, tum a ſe ſe Bononiæ tum alibi ab aliis e ſtella polari deductas, aptiſſime in eas quadrare quæ e tropicis obſervationibus eruuntur, ſi refractiones & parallaxes de tribus illis tabellis depromantur, ſecus plurium minutorum diſcrimina inveniri. Verum hæc eadem omnia priores illæ refractiones, & parallaxes præſtant.

Ex eo ergo tempore Caſſinianæ refractiones ab aſtronomis tractari ac experimentis probari cæptæ, ac brevi plerisque omnibus perſuaſum fuit Tychonicas antiquandas, ac refractionem aliquam vel in iis altitudinibus agnoſcendam quæ ſupra gradum 45 ad verticem uſque numerantur; cui rei cum pene unus repugnare videretur Ricciolius, novamque hanc Caſſini methodum in aſtronomia reformata exagitaſſet, hic & objecta diluit, & inventi ſui rationem omnem explicuit, præclara epiſtola ea de re conſcripta, quæ adjuncta eſt ad Montanarii ephemerides anni 1666.

Verum cum de eo ambigi adhuc poſſet anne refractiones pro locorum aut tempeſtatum diverſitate diverſæ forent, ex quo tabulæ uſus aut minus communis aut minus certus efficeretur, periculum facere lubuit num refractiones in Europæa temperie conceptæ maximis quoque zonæ torridæ æſtibus aptarentur. Ejus præſertim rei explorandæ gratia Richerius a Pariſienſi academia in Cayennam inſulam eſt delegatus, quæ inſula ab æquatore grad. 4. 56 haud amplius in ſeptentriones diſtat. Cum ergo is annum ibi fuiſſet ac plurimas aſtronomicas obſervationes inde in Galliam retuliſſet, liquido apparuit ſi altitudines Solis ab eo captatæ a refractionibus ex Caſſini tabula exſolverentur eamdem fere obliquitatem eclipticæ reſtitui, quam Bononienſes obſervationes exhiberent, ſecus ſi ea correctio negligeretur, atque hinc magnum ad Caſſinianæ tabulæ fidem momentum acceſſit, deinceps enim aſtronomi unanimi fere conſenſu eam adoptaſſe, aut parum certe inde mutaſſe niſi ſunt, veluti in Ger-

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mania celeberrimus Kirchius, in Anglia conſummatiſſimus obſervator Flamſtedius, in Italia vir cum aſtronomiæ tum aliarum diſciplinarum laude præſtantiſſimus Blanchinus, aliique, licet hic poſtremus ex quibuſdam ſtellarum obſervationibus refractionem hyeme nonnihil augendam ſuſpicatus ſit.

Aliquam tamen eſſe in minoribus ab horizonte altitudinibus refractionum inconſtantiam pluribus poſtmodum experimentis compertum fuit, contra atque accidit cum ad gradum præterpropter viceſimum ventum eſt. Quin & illud agnitum radiorum per atmoſphæram ſemitas minime rectas eſſe, ſed curvas. Hoc vero argumentum utrumque luculenter pertractavit Caſſinus filius in commentariis Pariſienſis academiæ anni 1714, ubi & in tabella refractiones tradidit quas ex hypoteſi trajectionis radiorum curvilineæ ſupputavit aſſumpta refractione eadem horizontali quam Pater poſuerat, hancque tabellam obſervationibus a ſe habitis accuratius reſpondere oſtendit. Summus quoque ille memoria noſtra philoſophus ac geometra Iſaacus Eques Neutonus tabulam aliam ex natura ipſa curvedinis radiorum erutam concinnavit, quam Edmundus Halleyus aſtronomorum ætate noſtra nulli ſecundus Regiæ ſocietatis Anglicæ tranſactionibus anni 1721 inſeruit. Denique ne omnes recenſeam extant perinſignis aſtronomi Philippi Hiræi refractiones inter ejus tabulas evulgatæ, quas refractiones ſibi ab obſervationibus probatas teſtatur. Verum harum tabularum omnium, ſi Hiræanas excipias, diſſidia ſupra quintumdecimum, aut viceſimum altitudinis gradum permodica ſunt, & Caſſini Patris numeri medium fere tenent, quemadmodum ex ipſarum tabularum collatione apparet quas huic capiti ſubjeci. Seorſim etiam adjeci tabellam parallaxeon Solis, ex Caſſini, Hiræi, atque Halleij ſententia.

Fecerunt præterea obſervationes nonnullæ intra circulum arcticum habitæ ut longe majores in ea zona quam in hiſce regionibus noſtris refractiones cenſerentur; cujus problematis reſolutio expectanda videtur a celeberrimis fratribus Nicolao, ac Ludovico Islæis, qui cum in Imperiali academia Petropolitana aſtronomica ac geographica provincia fungantur, multaſque in ampliſſima illa ditione locorum latitudines ab obſervationibus definire ſuſceperint, de hoc præſertim refractionum negotio certi aliquid conſtituere ſedulo ſtudent. Mihi quæ hactenus de hoc argumento in academiæ illius commentariis edita ſunt perpendenti, vix quicquam diverſitatis a refractionum noſtrarum quantitate inventum eſt; ſi enim magnum quiddam diſcriminis intercederet, cum illi modo ſtellas ad Boream poſitas, modo Solem aut ſtellas alias ad auſtrum obſervaverint, errorum ſumma in diſſidiis altitudinum poli appareret, quæ diſſidia vix ulla ſunt.

Hæc quidem de refractionum aſtronomicarum invento paullo fuſius ſum proſecutus, ut appareat quantum huic de quo agimus inſtrumento aſtronomia debeat, cum ab obſervationibus eo potiſſimum peractis & illarum exquirendarum occaſio & probandarum facultas primum oblata fuerit. Quæcumque vero de his retuli maximam partem e Caſſini epiſtolis, quas Marchio Malvaſia ephemeridibus ſuis anno 1662, ſuiſque Montanarius anno 1666 ſubjecerunt, tum vero e ſpecimine obſervationum Caſſini, aut ex ejus elementis aſtronomicis, necnon e commentario de hac meridiana linea anno 1695 edito excerpſi.

Pe-

Parallaxes Solis ex diverſorum aſtronomorum ſententia.

Diſt. a vert.	Caſſino.	Hiræo.	Halleyo.	Altitudo.
G	″	″	″	G
0	0	0	0	90
5	1	0	0	85
10	2	1	2	80
15	3	2	3	75
20	3	2	4	70
25	4	3	5	65
30	5	3	6	60
35	6	3	7	55
40	6	4	8	50
45	7	4	9	45
50	7	5	10	40
55	8	5	10	35
60	8	5	11	30
65	9	5	11	25
70	9	5	12	20
75	9	6	12	15
80	10	6	12	10
85	10	6	12	5
90	10	6	$12\frac{1}{2}$	0

Tabulæ refractionum ad ſingulos gradus altitudinis aut diſtantiæ a vertice ex diverſorum aſtronomorum computo.

Diſt. a vert.	Caſſini Patris		Hiræi		Caſſini filii		Nevtoni		
G	I	II	I	II	I	II	I	II	G
1	0	1	0	1	0	1	0	1	89
2	0	2	0	2	0	2	0	2	88
3	0	3	0	3	0	3	0	3	87
4	0	4	0	4	0	4	0	4	86
5	0	5	0	6	0	5	0	5	85
6	0	6	0	7	0	6	0	6	84
7	0	7	0	8	0	7	0	7	83
8	0	8	0	10	0	8	0	8	82
9	0	9	0	11	0	9	0	9	81
10	0	10	0	12	0	10	0	10	80
11	0	11	0	14	0	11	0	11	79
12	0	12	0	15	0	12	0	12	78
13	0	13	0	17	0	13	0	13	77
14	0	14	0	18	0	14	0	14	76
15	0	16	0	20	0	16	0	15	75
16	0	17	0	21	0	17	0	16	74
17	0	18	0	23	0	18	0	17	73
18	0	19	0	24	0	19	0	18	72
19	0	20	0	25	0	20	0	19	71
20	0	21	0	26	0	21	0	20	70
21	0	22	0	28	0	22	0	21	69
22	0	24	0	30	0	24	0	22	68
23	0	25	0	31	0	25	0	23	67
24	0	26	0	32	0	26	0	24	66
25	0	27	0	33	0	27	0	25	65
26	0	28	0	35	0	28	0	26	64
27	0	30	0	37	0	30	0	27	63
28	0	31	0	39	0	31	0	28	62
29	0	33	0	40	0	33	0	30	61
30	0	34	0	42	0	34	0	31	60
31	0	35	0	44	0	35	0	32	59
32	0	37	0	46	0	37	0	34	58
33	0	38	0	48	0	38	0	35	57
34	0	40	0	50	0	40	0	36	56
35	0	41	0	52	0	41	0	38	55
36	0	43	0	54	0	43	0	39	54
37	0	45	0	56	0	45	0	40	53
38	0	47	0	58	0	47	0	42	52
39	0	49	1	0	0	49	0	44	51
40	0	50	1	2	0	50	0	45	50
41	0	52	1	4	0	52	0	47	49
42	0	54	1	6	0	54	0	48	48
43	0	56	1	7	0	56	0	50	47
44	0	58	1	9	0	58	0	52	46
45	0	59	1	11	0	59	0	54	45
									Altit.

Diſt. a vert.	Caſſini Patrrs		Hiræi		Caſſini filii		Nevtoni		
G	I	II	I	II	I	II	I	II	G
46	1	1	1	13	1	1	0	56	44
47	1	3	1	15	1	3	0	58	43
48	1	5	1	17	1	5	1	0	42
49	1	7	1	19	1	7	1	2	41
50	1	10	1	22	1	10	1	4	40
51	1	12	1	24	1	12	1	6	39
52	1	15	1	27	1	15	1	8	38
53	1	18	1	30	1	18	1	11	37
54	1	20	1	33	1	20	1	13	36
55	1	23	1	36	1	23	1	16	35
56	1	27	1	40	1	27	1	19	34
57	1	30	1	43	1	30	1	22	33
58	1	34	1	47	1	34	1	25	32
59	1	38	1	51	1	38	1	28	31
60	1	42	1	55	1	42	1	32	30
61	1	46	1	59	1	46	1	36	29
62	1	51	2	3	1	51	1	40	28
63	1	55	2	7	1	55	1	44	27
64	2	0	2	12	2	0	1	49	26
65	2	6	2	18	2	6	1	54	25
66	2	12	2	24	2	12	1	59	24
67	2	18	2	31	2	18	2	5	23
68	2	25	2	38	2	25	2	11	22
69	2	31	2	44	2	32	2	18	21
70	2	39	2	51	2	39	2	26	20
71	2	49	3	1	2	49	2	34	19
72	3	0	3	12	2	59	2	43	18
73	3	11	3	23	3	10	2	53	17
74	3	24	3	36	3	22	3	4	16
75	3	38	3	51	3	36	3	17	15
76	3	53	4	7	3	52	3	31	14
77	4	12	4	25	4	10	3	47	13
78	4	33	4	46	4	31	4	5	12
79	4	58	5	11	4	55	4	27	11
80	5	28	5	41	5	23	4	52	10
81	6	3	6	17	5	57	5	22	9
82	6	47	7	1	6	40	6	0	8
83	7	43	8	2	7	32	6	47	7
84	8	55	9	8	8	38	7	45	6
85	10	32	10	20	10	6	9	2	5
86	12	48	12	26	12	2	10	48	4
87	16	6	15	44	14	46	13	20	3
88	21	4	20	43	18	40	17	8	2
89	27	55	26	35	24	19	23	7	1
90	32	20	32	0	32	20	33	45	0
									Altit.

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Caput XIV.

De eclipticæ obliquitate ac Bononiæ latitudine ab hiſce obſervationibus primum accurate definita.

Superiori capite & refractionum exquirendarum neceſſitatem & inventarum ſucceſſum enarravi, ac ſtellæ polaris altitudines cum ſolſtitialibus hoc denique pacto a Caſſino conciliatas dixi, cujus præſertim rei gratia indago illa ſuſcepta fuerat. Quæ vero inde prodierit poli elevatio, quæve eclipticæ obliquitas, non memoravi, quod de his mihi pluribus ſeorſim agendum reſervaſſem. Primum autem ſtellæ illius obſervationes tam ab ipſo quam a Ricciolio habitas afferam.

Caſſinus a Kalendis Januarii anni 1656 quotidie ad diem 8 in ædibus Marchionis Malvaſiæ gnomone pedes 36 Bononienſes alto, quem gnomonem ad hoc ipſum erexerat, mane ac veſpere ſtellam polarem per meridianum excurrentem ſibi obſervatam memorat, & meridiani illius poſitum per maximas ejuſdem ſtellæ digreſſiones accuratiſſime expenſum.

Matutina ſtellæ diſtantia a vertice fuit	gr. 48. 2. 6
Veſpertina vero	gr. 42. 57. 10
Differentia utriuſque	gr. 5. 4. 56
Dimidium, ſeu diſtantia ſtellæ a polo boreo	gr. 2. 32. 28
Inde ergo diſtantia poli a vertice	gr. 45. 29. 38
Cujus complementum ſive elevatio poli in iis ædibus	gr. 44. 30. 22
Templum vero Divi Petronii iiſdem ædibus auſtralius invenit	2
Ergo elevatio poli ſeu latitudo ad Divi Petronii	gr. 44. 30. 20

Ricciolius vero cum Grimaldo ad Divæ Luciæ duplicem altitudinis poli indaginem, utramque per ſtellam polarem inſtituit, ac in aſtronomia reformata retulit libro 4 cap. 14; alteram ſub exitum anni 1655 ſextantibus duobus, quorum radii pedum 7, & 12

Altitudo ſtellæ maxima veſpere	gr. 47. 2. 42
Altitudo minima mane	gr. 41. 57. 36
Monet haſce altitudines pluries captatas paucis interdum ſecundis variaſſe, ſed earum differentiam quæ frequentius recurreret fuiſſe	gr. 5. 5. 6
Dimidium ſeu diſtantia ſtellæ a polo	gr. 2. 32. 33
Unde altitudo poli ad Divæ Luciæ	gr. 44. 30. 9

Tem-

Templum vero Divi Petronii borealius quam Divæ Luciæ invenit ipſe actis menſuris	10
Latitudo igitur ad Divi Petronii	gr. 44.30.19
Altera Riccioli inveſtigatio partim menſe Octobri anni 1655 partim Aprili 1656 peracta fuit gnomone præalto, pedum nempe Bononienſium 66.	
Maxima ſtellæ altitudo ineunte Octobri 1655 veſperi iterato obſervata	gr. 47. 2.43
Ut hanc reducat ad finem ejus anni detrahi jubet pro rata acceſſus annui ſtellæ ad polum (qui acceſſus eſt ſecundorum 20)	5
Fit maxima altitudo ſtellæ ad exitum anni 1655	gr. 47. 2.38
Anno autem 1656 Aprili minima ſtellæ altitudo ter capta	gr. 41.57.48
Ut reducatur ad finem anni 1655 ſubducit	6
Fit minima altitudo exeunte anno 1655	gr. 41.57.42
Eodem tempore maxima nuper inventa fuit	gr. 47. 2.38
Differentia igitur altitudinum	gr. 5. 4.56
Ejus dimidium ſeu diſtantia ſtellæ a polo	gr. 2.32.28
Unde altitudo poli ad Divæ Luciæ	gr. 44.30.10
Ob parallelorum differentiam ſupra memoratam adde	10
Conflabitur latitudo ad Divi Petronii	gr. 44.30.20

a priori determinatione unico ſecundo diſcrepans, & ad unguem reſpondens ei quam Caſſinus invenit.

Merito hic tantus obſervationum conſenſus obſervatoribus ipſis mirus eſt habitus, nobis vero eo magis admirationi eſſe debet poſtquam ſtellæ illius annuæ viciſſitudines ſunt perſpectæ; notum eſt enim poſt Picardi, Flamſteedii ac utriuſque Caſſini obſervationes anomaliam quandam, Riccioli ętate incompertam polari ſtellæ contingere, qua fiat ut per annum minime æquabiliter ad polum accedat, quinimo interdum ad aliquid temporis ab eo recedat; cujuſmodi aberrationes & ſtellis aliis communes eſſe, neque modo ſecundum declinationem ſed etiam ſecundum aſcenſionem rectam aliquas eſſe, Maraldus etiam, Roemerus, Horrebovius deprehenderunt, earumque evagationum ordinem ac leges, in parallaxi annua fruſtra quæſitas, egregius nuper aſtronomus Jacobus Bradleyus expendit, de quo argumento nos etiam nonnulla ſcriptis mandavimus. Propterea ne qua hujuſmodi aberratio eas obſervationes vitiare poſſit quæ ad definiendas locorum latitudines haberi ſolent, monuit Picardus in itinere Uranoburgico, & Jacobus Caſſinus in tabulis tranſitus hujuſce ſtellæ per meridianum, tutiſſimam rationem eſſe ſi tam maxima quam minima altitudo iiſdem, aut non valde diſſitis noctibus exploretur; ita enim neceſſitas evitatur redu-

reductionis illius, qua Ricciolius in hac poſtrema determinatione opus habuit, quæque ſi pro rata temporis diſtribuatur, fallax eſſe poteſt. Qui vero factum ſit ut in experimentis hiſce non fefellerit inveſtigatu eſt difficile.

Utcumque ſit, minime dubitandum quin apparans illa elevatio poli ad Divi Petronii gr. 44. 30. 20 tam proxime ad verum accederet quam obſervationibus accedere licet. Inde ergo Ricciolius eclipticæ obliquitatem eruerat grad. 23. 30. 20 ea methodo, quæ iis temporibus aſtronomis familiaris erat; ut enim refractionum ſuſpicionem evitarent, qua ſuſpicione hyberni tropici altitudines laborare agnoſcebant (de æſtivo enim nil tale verebantur) loci latitudinem ex polari ſtella definitam cum diſtantia a vertice tropici æſtivi comparabant, quorum arcuum differentia eſt eclipticæ obliquitas. En ejus obliquitatis calculum obſervationi ſolſtitiali omnium primæ hoc gnomone habitæ aptatum, neglectis refractionibus.

Anno 1655 die 21 Junii diſtantia meridiana apparens limbi inferioris Solis a vertice obſervata eſt	gr. 21. 15. 38
Superioris vero limbi	gr. 20. 42. 30
Diameter Solis quanta hoc inſtrumento apparuit	31. 8
Semidiameter	15. 34
Apparens ergo centri diſtantia a vertice	gr. 21. 0. 4
Parallaxis Solis ſubducenda circiter	4
Diſtantia centri a vertice a parallaxi exſoluta, eademque diſtantia tropici æſtivi a vertice (quod Sol in gr. 29. 46 Geminorum poſitus minus ſecundo a tropico abeſſet)	gr. 21. 0. 0
Latitudo apparens ad Divi Petronii e ſtella polari inventa	gr. 44. 30. 20
Ergo tropici declinatio ſive obliquitas eclipticæ apparens	gr. 23. 30. 20

quantam ſcilicet a Ricciolio hac methodo inventam memoravimus.

Hoc vero ipſum eſt in quo Caſſinus (uti ſupra diximus) refractionum ultra gradum 45 altitudinis minime negligendarum neceſſitatem agnovit, hi namque numeri tam obliquitatis eclipticæ quam latitudinis in diſtantiam a vertice tropici hyberni ex obſervationibus inventam minime quadrabant, vel ſi hæc diſtantia a refractionibus Tychonicis, aliiſve id temporis receptis emendaretur; ſervatis autem refractionibus & obliquitas eclipticæ, & latitudo paulo alia inventa, & ſolſtitii utriuſque obſervationes cum ſtellæ polaris altitudinibus conciliatæ ſunt in hunc modum.

Die 21 Junii 1655 diſtantia centri Solis a vertice a refractionibus, ac parallaxibus Caſſinianis expedita (uti in ſerie obſervationum) eademque diſtantia Tropici æſtivi a vertice	gr. 21. 0. 23
Die vero 21 Decembris 1656 diſtantia centri a vertice ab iiſdem refractionibus ac parallaxibus correcta uti in eadem ſerie	gr. 67. 58. 22
Diſtantia Solis a tropico in gr. 0. 26 Capricorni	2

Ergo diſtantia tropici hyberni a vertice	gr. 67. 58. 24
Diſtantia tropici æſtivi ut ſupra	gr. 21. 0. 23
Vera igitur tropicorum diſtantia	gr. 46. 58. 1
Cujus dimidium obliquitas vera eclipticæ	23. 29. 0 $\frac{1}{2}$
Qua addita diſtantiæ tropici æſtivi a vertice conſit vera latitudo ad Divi Petronii	gr. 44. 29. 23 $\frac{1}{2}$
Ex ſtella vero polari apparens altitudo poli ad D. Petronii elicita fuerat	gr. 44. 30. 20
Subducta refractione huic altitudini debita ex tabula Caſſiniana	1. 0
Fit rurſum vera latitudo ad Divi Petronii	44. 29. 20

ſecundis ſcilicet 3 $\frac{1}{2}$ haud amplius diſcrepans ab ea quæ a tropicorum obſervationibus eſt eruta, ut propterea merito Caſſinus veram latitudinem ad Divi Petronii atque in ipſo perpendiculi puncto ſtatuerit gr. 44. 29. 22, & veram eclipticæ obliquitatem gr. 23. 29. 0.

Ubi notandum ſi pro iis refractionibus ac parallaxibus quibus in hac obſervationum ſerie ad mentem Caſſini corrigenda uſi ſumus, numeros hoſce ex triplici illa tabella ad Malvaſiæ ephemerides adjecta ac cum Kepleriana parallaxi conjuncta depromere lubuiſſet, futurum ſane ut ex eo obliquitas eclipticæ parum mutaretur, quippe quæ prodiiſſet gr. 23. 29. 5, altitudo vero poli tam e ſtella polari quam e ſolſtitiis 15, aut 18 ſecundis minor inde conſurgeret, nempe gr. 44. 29. 5. Hac vero obliquitate nempe gr. 23. 29. 5, & poli altitudine gr. 44. 29. 5 (quos numeros Caſſinus ipſe tradiderat in exemplis quæ Malvaſiæ ephemeridibus ſubjecta ſunt) Montanarius, Fabrius, Guglielminus in calculis ſuis ſubducendis utebantur, antequam Caſſinus parallaxi Solis accuratius conſtituta triplicem illam tabulam antiquaſſet, ac ad priores refractiones rediiſſet.

Atque hæc prima eſt veræ obliquitatis eclipticæ inventio, cum ante illud tempus aſtronomi eam quæ vera eſſet ab ea quæ ob refractionum fallacias appareret haud ſatis diſtinxiſſent. Ex eo tempore plerique omnes numeros illos gr. 23. 29. 0 magno hocce inſtrumento primum compertos ratos habuerunt, aut certe perpaucis ſecundis ſcrupulis inde diſceſſerunt, præſertim cum obſervationes & Bononiæ & alibi ad aliquot ſaltem annos deinceps habitæ eoſdem comprobarent. Sed hoc ipſum mihi jam accuratius peculiari capite eſt pertractandum.

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Caput XV.

De diverſitatibus quæ in eclipticæ declinatione hoc inſtrumento poſtmodum inventæ ſunt.

Aggredior hoc capite celebrem illam ac aſtronomorum pene omnium ſtudiis nobilitatam diſceptationem, conſtans ne an mutabilis ſit eclipticæ ad æquinoctialem circulum inclinatio; quam niſi ab obſervationibus immoto quopiam, eoque maximo inſtrumento, quale noſtrum hoc eſt, peractis annorum octoginta ſpatio dirimi potuiſſe, aut ſaltem adhuc poſſe arbitramur, vereor ut aſtronomis alia uſquam ejus rei dijudicandæ ratio ſuppetat.

Mihi certe ut primum haſce obſervationes undique colligere, atque inter ſe ſe conferre, ac contendere cæpi haud difficile fuit aliquam a primis inſtrumenti temporibus ad eam ætatem obliquitatis eclipticæ immutationem agnoſcere. Verum cum hæc ipſa immutatio cum quadam altitudinis poli inconſtantia conjuncta eſſet (quæ mihi res in aſtronomia inexplicabilis ſemper eſt viſa) in plures dubitationes diſtrahebar, ac modo inſtrumenti nondum a me exper ſi vitia, modo obſervandi indiligentiam, modo aeris noſtri naturam ſenſim variatam, modo alia comminiſcebar, quæ res annos pene quadraginta animi ancipitem me habuit, atque ad opus hoc in publicum emittendum tardiorem effecit; necdum ſatis me perſpicere fateor quid denique de re hac tota certo ſtatui poſſit. Verum ut ordine procedam eclipticæ variationes a poli viciſſitudinibus quantum ejus fieri poteſt ſeorſim expendam.

Primum ergo en ſeriem diſtantiarum tropicarum a vertice quotquot ab inſtrumenti conſtructione ad hoc tempus colliguntur ex obſervationibus vel ipſo ſolſtitio habitis vel minus biduo, ut plurimum, inde diſſitis, reductione ad ipſos tropicos ubi opus erat adhibita ex ea tabella quam capite 5 tradidi. Ubi advertendum nullam a me in hac ſerie rationem habitam eorum vitiorum, quæ anno 1722 in libramento lineæ comperta ſunt, ac capite undecimo in tabula recenſita, tum quod de eorum temporibus non liqueret, tum præſertim quod æquales in locis utriuſque ſolſtitii ex hac cauſa correctiones utrique diſtantiæ tropicæ debeantur, nempe utrobique ſecunda 14 addenda, (quod capite undecimo admonui) ac propterea tropicorum intervallum nihil quicquam inde mutetur.

Diſtantiæ tropici Cancri a vertice a refractione & parallaxi e Caſſiniana tabella exſolutæ, ad Divi Petronii.

Junii		G I II		G I II
1655	21	21.0.23	media	21.0.21
	22	21.0.19		
1656	21	21.0.20		21.0.20
1658	20	21.0.21	media	21.0.24
	21	21.0.26		
1663	20	21.0.31	media	21.0.32
	21	21.0.36		
	22	21.0.38		
1665	21	21.0.17		21.0.17
1667	21	21.0.23	media	21.0.18
	22	21.0.18		
	23	21.0.14		
1668	20	21.0.17	media	21.0.10
	21	21.0. 8		
	22	21.0. 5		
1669	19	21.0.20	media	21.0.14
	20	21.0.14		
	21	21.0.18		
	22	21.0. 6		
1670	20	21.0. 9	media	21.0. 9
	21	21.0.18		
	22	21.0. 1		
1672	20	21.0.11	media	21.0. 9
	21	21.0. 7		

Diſtantiæ tropici Capricorni a vertice a refractione & parallaxi e Caſſiniana tabella exſolutæ ad Divi Petronii.

Decemb.		G I II		G I II
1656	21	67.58.24		67.58.24
1658	20	67.58.12	media	67.58.12
	21	67.58.13		
1659	20	67.58. 8		67.58. 8
1660	20	67.58. 1	media	67.58. 0
	21	67.58. 0		
1663	21	67.58. 0	media	67.58. 0
	22	67.57.59		
1666	21	67.58. 7		67.58. 7
1667	22	67.58.14		67.58.14
1668	19	67.58.14	media	67.58.11
	20	67.58. 9		
	21	67.58.12		
	22	67.58.11		
1669	19	67.58.10	media	67.58.13
	22	67.58.16		

Junii		G I II	G I II
1673	21	21.0.14	media 21.0.15
	22	21.0.16	
1674	19	21.0. 4	media 21.0. 9
	20	21.0.15	
	22	21.0. 8	
1690	19	21.0.56	media 21.1. 1
	20	21.1. 4	
	21	21.0.58	
	22	21.1. 8	
1695	19	21.0.57	media 21.1. 3
	20	21.0.59	
	21	21.1. 9	
	22	21.1. 9	
1696	20	21.0.50	media 21.0.56
	21	21.1. 0	
	22	21.0.59	
1697	19	21.0.48	media 21.1. 3
	20	21.1.11	
	21	21.1.13	
	22	21.1. 2	
1698	19	21.1. 4	media 21.1. 7
	20	21.1.10	
	21	21.1. 6	
	22	21.1. 7	
1699	19	21.1. 1	media 21.1. 5
	20	21.1. 1	
	21	21.1. 7	
	22	21.1. 0	
1700	23	21.0.59	21.0.59
1701	20	21.0.57	media 21.1. 3
	21	21.1. 0	
	22	21.1.12	
	23	21.1. 2	

Decemb.		G I II	G I II
1691	20	67.58.30	67.58.30
1695	21	67.58.20	67.58.20
1697	19	67.58. 9	media 67.58.11
	20	67.58.13	
1698	20	67.58. 8	media 67.58.10
	22	67.58.12	

Junii		G I II	G I II	Decemb.		G I II	G I II
1702	21	21.0.48					
	22	21.1. 7	media 21.0.55				
	23	21.0.51					
1703	22	21.1. 4	media 21.1. 1	1703	21	67.58. 9	67.58. 9
	23	21.0.58					
1704	20	21.0.58					
	21	21.0.57	media 21.0.58				
	22	21.0.58					
1705	22	21.0.58	21.0.58	1705	20	67.58.16	media 67.58.14
					23	67.58.13	
				1706	20	67.58.24	67.58.24
1707	22	21.046	21.0.46	1707	21	67.58.17	67.58.17
				1709	19	67.58. 5	67.58. 5
1710	20	21.0.44	media 21.0.36				
	22	21.0.29					
1711	22	21.0.38	media 21.0.39				
	23	21.0.40					
1712	22	21.0.54	media 21.0.53				
	23	21.0.53					
1713	21	21.0.44	media 21.0.46				
	22	21.0.48					

Deinceps (ac forte aliquanto prius) ſingulis diſtantiis tropicis tam æſtivis quam hybernis hic notatis addas licet ſecunda 14 circiter ob depravatum lineæ libramentum, quemadmodum capite undecimo dictum eſt.

				1718	20	67.57.44	67.57.44
1719	21	21.0.51	media 21.0.48				
	23	21.0.46					
1720	20	21.0.53	media 21.0.48				
	21	21.0.43					
1721	22	21.0.36	media 21.0.41				
	23	21.0.46					

Ju-

Junii		G I II	G I II	Decemb.		G I II	G I II
1722	20	21.0.44	media 21.0.47	1722	21	67.57.49	media 67.57.52
	21	21.0.47			22	67.57.54	
	22	21.0.51					
	23	21.0.43					
1723	20	21.0.48	media 21.0.48				
	21	21.0.47					
	22	21.0.50					
	23	21.0.48					
1724	19	21.0.48	media 21.0.45				
	21	21.0.47					
	22	21.0.41					
1725	21	21.0.41	media 21.0.31	1725	21	67.58.3	67.58.3
	22	21.0.21					
1726	20	21.0.43	media 21.0.31				
	21	21.0.28					
	23	21.0.21					
1727	21	21.0.44	media 21.0.40				
	22	21.0.35					
	23	21.0.42					
1728	20	21.0.38	21.0.38	1728	21	67.58.12	67.58.12
1729	20	21.0.16	media 21.0.38				
	21	21.0.50					
	22	21.0.49					
1730	20	21.0.32	media 21.0.36				
	22	21.0.40					
1731	20	21.0.51	media 21.0.50	1731	23	67.57.46	67.57.46
	21	21.0.53					
	22	21.0.45					
	23	21.0.52					
1732	20	21.1.0	media 21.0.54	1732	21	67.57.41	media 67.57.40
	21	21.0.48			22	67.57.37	
					23	67.57.43	
1733	21	21.0.50	media 21.0.52	1733	20	67.57.37	media 67.57.44
	22	21.0.53			21	67.57.46	
					23	67.57.49	

Junii	G I II		G I II	Decemb.	G I II	G I II
1734 21	21.0.57	media	21.0.53	1734 22	67.57.50	67.57.50
22	21.0.52					
23	21.0.50					

Nemo mihi ut arbitror vitio vertet quod pro diſtantiis a vertice apparentibus veras ipſas diſtantias, eaſque e Caſſini potius quam aliorum tabulis a parallaxi ac refractione caſtigatas attulerim, non enim id agimus ut ipſam nunc eclipticæ obliquitatem menſuris comprehendamus, ſed ut denique decernamus an illa quicquam mutetur, qua in re perinde eſt veras an apparentes diſtantias ſpectemus, modo refractiones quibus ad illas emendandas utimur ex eadem perpetuo tabula depromamus.

Nunc ergo ſi tropica quælibet diſtantia æſtiva cum hyberna, vel eodem vel proximis ante aut poſt annis obſervata conferatur, apparebit quæ quovis tempore fuerit tropicorum intercapedo, ac ſubinde eclipticæ declinatio, quæ ejus intervalli eſt dimidia.

Veluti ſi diſtantia tropici æſtivi a vertice anno 1656 inventa	gr. 21. 0.20
cum diſtantia tropici hyberni ejuſdem anni componatur, quæ fuit	gr. 67.58.24
fiet tropicorum diſtantia	gr. 46.58. 4
& obliquitas eclipticæ anno 1656	gr. 23.29. 2
ſi vero diſtantia æſtiva anni 1695	gr. 21. 1. 3
cum hyberna ejuſdem anni conferatur	gr. 67.58.20
erit tropicorum intervallum	gr. 46.57.17
obliquitas vero eclipticæ anno 1695	gr. 23.28.38
ac denique ſi æſtiva anni 1733	gr. 21. 0.52
cum ejus anni hyberna comparetur	gr. 67.57.44
emerget tropicorum intercapedo	gr. 46.56.52
& declinatio eclipticæ anno 1733	gr. 23.28.26

Apparet ergo diſtantiam tropicorum ex anno 1656 ad 1695 ſecundis 47, ad annum vero 1733 ſcrupulo primo ac ſecundis 12 decreviſſe, ac propterea eclipticæ angulum cum æquatore dimidiis illis differentiis fuiſſe contractum; quæ diſcrimina tanta ſunt ut niſi obſervationibus vim inferamus, aut obſervatores omnino oſcitanter egiſſe arbitremur, aliqua diſſidii cauſa in cælo ipſo ſit agnoſcenda.

Non ignoro futuros qui haſce diverſitates a refractionum inconſtantia explicari poſſe arbitrentur, qui tamen neſcio quam apte & cohærenter ad communia experimenta dicturi ſint, ſtellarum enim inerrantium meridianas altitu-

dines

dines vix quicquam diverſas apparere, ſive noctu, ſive interdiu, hac vel illa anni tempeſtate obſerventur, ut aſtronomi accuratiſſimi teſtati ſunt, & nos in hoc Bononienſi obſervatorio plurium annorum uſu compertum habemus, ſi modo variationes illas ſeponamus, quæ vel a lentiſſimo fixarum motu, vel a ſingularum erroribus nuper detectis oriuntur, qui ipſi errores & perexigui ſunt, & annuo fere ſpatio iidem recurrunt. Plane in ſtella Sirii nihil ſibi accidiſſe quod ejuſmodi ſuſpicionem ingereret monuit Hiræus initio tabularum, & Jacobus Caſſinus in ejus parallaxim annuam ſubtiliſſime inquirens vix una vel altera ſtellæ diametro immutatam annuo ſpatio altitudinem comperit, cum tamen hæc tantumdem fere a Pariſienſi vertice quantum hybernus tropicus a Bononienſi abſcedat. Ad hæc ſi aeris conſtitutionem aliis anni diebus aliam eſſe, idque in refractionibus, vel ſupra viceſimum altitudinis gradum aliquid ad ſenſum facere poſſe concedamus, illud tamen paradoxi ſimile eſt quod ad rem hanc explicandam aſſumi oportet: refractiones ex anno 1656 ad 1695, ac rurſum ex hoc ad 1733 adeo mutatas ut mutatio hæc ſecundorum ibi 47, hic 72 diſcrimen effecerit; præſertim cum ex hac ſerie appareat minores mutationes hyberno tropico, ubi refractio major eſt, quam æſtivo, ubi minor, animadverſas, ac diſtantiam tropici hujus a vertice interdum triplo magis adauctam quam refractio tota quam illi tribuimus eam minuat.

Erunt fortaſſe alii qui inſtrumenti vitia vel cum primum conſtructum eſt vel cum pluries expenſum incomperta, aut perperam taxata in cauſa eſſe comminiſcantur. Mihi quidem aſtronomica inſtrumenta ſummo ſtudio fabricanda ac pari ſolertia expendenda videntur, verum ubi maximam quam præſtare licet diligentiam in eo poſitam conſcius tibi fueris, moroſum eſt, ac pene infinitum ſi quoties inexpectatum quiddam obſervando detexeris, ac rem ita eſſe iterato agnoveris ad ſuſpiciones relabaris, ac fidem ipſe tuam in dubium revoces. Deinde ſi rem ſedulo perpendamus hæc de eclipticæ variatione indago ejuſmodi eſt ut vix quicquam ſcrupuli ab exiguis gnomonis hujuſce mutationibus oriri poſſit. Nam foraminis conſtitutionem quod attinet, niſi ejus centrum vel in ipſa inſtrumenti conſtructione vel in ejus reſtitutione ita locatum fingamus ut in boream, vel in auſtrum pluribus particulis aberraret, non efficiemus, ut tropicorum diſtantia ſolido minuto ac eo amplius varia eſſe poſſit. Id autem vitii demiſſo tantum perpendiculo facile adeo explorari poterat, ut mirum ſit neque Caſſino, neque Fabrio, neque Montanario, neque ipſi Mengolo qui inſtrumenti redarguendi cauſas quæſiiſſe viſus eſt, neque nobis perſpectum fuiſſe. Porro centri altitudo ut diverſis annis tropicorum diſtantiam minuto diverſam exhiberet, vel partibus 1676 augenda vel 6714 minuenda foret, quemadmodum ſubductis calculis reperi, quod ſine concamerationis totius labe atque adeo ruina fieri non potuit. Equidem fateor ſi altitudinem repente eo temporis ſpatio quod inter ſolſtitia duo proxima interceſſit depravatam fingamus, paucarum particularum vitium ſufficere quo tantum diſſidii emergat; verum ſi forte hoc ipſum ſemel contigiſſe opinemur, anne toties credendum eſt quoties diſtantiam illam tropicorum denuo mutatam obſervationes evincunt? Idem de lapidum vitiis judicium ferre licet, ſi forte quis horum librationibus iterato ac diligenter peractis non acquieſcat;

illi enim tot, & tam variæ & ſubitæ & inter ſe diſpares lapidum commotiones fingendæ erunt, ut vix in maceria aliqua ac ruderibus temere congeſtis tale quippiam contingat. Nam quod attinet eas luxationes ſane exiguas quas anno 1722 invenimus, nulla earum ratio in eclipticæ obliquitate, ſed tantum in altitudine poli e ſolſtitiis inveſtiganda, habenda eſt, quod utriuſque loci ſolſtitialis vitia eandem fere ad unguem correctionis quantitatem poſcant, uti ſæpe diximus.

Reliquum eſt ut hæc diſſidia obſervandi difficultatibus ac erroribus tribuant, qui ſi eorum diſſidiorum partem aliquam ab hac cauſa petendam exiſtimant, facile aſſentior; ſin vero rem totam ex hoc explicari poſſe autumant, neceſſe eſt ut miras quaſdam ac conſtantes errandi leges ab iis qui ſolſtitiorum obſervationes egerunt ſervatas eſſe fateantur; veluti quod ex anno 1690 ad annum circiter 1705 æſtivo ſolſtitio nunquam minores ſed perpetuo majores limborum Solis a perpendiculo diſtantias notaverint quam anno 1655 ac proximis inde aliis notatæ ſint, contra hyberno ſolſtitio in hunc diem perpetuo fere per defectum, nuſquam per exceſſum peccarint. Sed hæc ex iis quæ ſtatim ſubjungam fient magis manifeſta.

Nunc enim poſtquam eclipticæ declinationem minime conſtantem invenimus reliquum eſt ut in illud inquiramus anne ejus mutationis certa ratio conſtitui ulla poſſit. Duplex de hoc ætate noſtra aſtronomorum eſt ſententia. Quidam inclinationem illam perpetuo minui exiſtimant, alii viciſſitudines ejus aliquas ſane agnoſcunt, ſed eas denique evaneſcere atque eclipticam in priorem poſitum ſe ſe reſtituere cenſent, qui enim variationem omnem pernegant atque id quodcumque apparet obſervationum ludibriis tribuunt, ſatis ut arbitror ex harum Bononienſium obſervationum ordine refelli poſſunt.

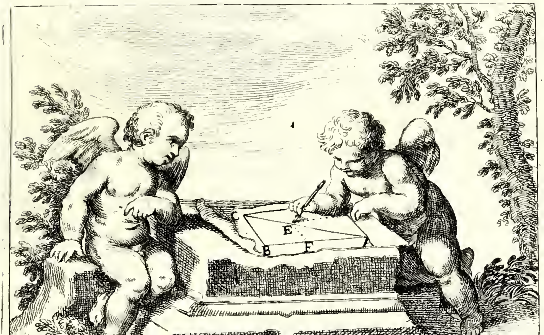
Priorem ſententiam aſtronomis nonnullis olim receptam, dein recentioribus minus probatam ac pene obſoletam revexit ætate noſtra eximius aſtronomus Eugenius Eques Louvillæus celebri diſſertatione de hoc argumento vulgata in actis eruditorum Lipſiæ anni 1719, idemque argumentum pluribus poſtmodum ſuccedentium annorum obſervationibus illuſtravit, quæ extant in commentariis regiæ academiæ Pariſienſis. Is ergo rem omnem ab antiquiſſimis Pitheæ Maſſilienſis temporibus repetens, ac inde ad Eratoſthenem, Ptolemæum, Albategnium, alioſque, primum Arabes, tum Europæos aſtronomos progrediens, eclipticæ atque æquatoris angulum perpetuo, & æquabiliter imminutum reperit, ita quidem ut intervallo annorum præterpropter 2000 minutis 21 decreverit; ſi modo veræ locorum latitudinis, quibus locis obſervationes actæ ſunt, ratio habeatur, ac obſervationes ipſæ a parallaxibus Solis, quas illi perperam conſtituerant, necnon a refractionibus liberentur. Angulum vero illum accuratiſſime ſibi definitum memorat anno 1715 graduum 23. 28. 24, unde ex illa quam tradit proportione efficitur anno 1656 fuiſſe grad. 23. 29. 1, nempe eum fere ad unguem quem ex utroque illius anni ſolſtitio hoc gnomone obſervato paulo antea ſupputavimus, ut propterea determinatio hæc in earum cenſum referri poſſit quas ille ad ſententiam ſuam firmandam undique collegit. Nuper etiam opinionem eandem egregio ejuſdem academiæ ſocio Godino argumentis pluribus confirmatam Lutetia ad me ſcri-

pſit

pſit præclarus juvenis Franciſcus Algarottus & ab his, & ab optimis quibuſque ſtudiis excultiſſimus.

Caſſinus autem etſi priorum ſolſtitiorum quæ hoc gnomone obſervaverat experimento confiſus eclipticæ obliquitatem annuo decremento ſecundorum ſex minui notavit in iis exemplis quæ Malvaſiæ ephemeridibus ſubjecit, non eam tamen diminutionis legem perpetuam ſtatuit, neque ad anteacta tempora protulit, quinimo diſſertationibus duabus, quas in eadem academia habuit, altera die 31 Martii 1672 de Maſſiliæ civitatis latitudine, altera die 31 Julii 1693 de altitudinis poli diverſitatibus, ita ſibi perſuaſum eſſe oſtendit aliquam ſane eſſe cum polorum, tum eclipticæ inconſtantiam, verum evagationem omnem intra unius vel alterius minuti fines conſiſtere. In eandem ſententiam Hiræus nonnulla edidit in ejus academiæ commentariis, ac Maraldus ſibi quoque, necnon viro ſummo Malezievio probari literis ad me ſuis ſignificavit; neque ab ea Jacobum Caſſinum abhorrere arbitror, cui obliquitatem illam ſuperiore anno gr. 23. 28. 20 inventam Celſius Pariſiis degens, ac cum eo obſervationibus vacans, nuper epiſtola ſua me monuit.

Ut ergo appareat quid denique e ſolſtitiis Bononiæ obſervatis efficiatur, declinationes eclipticæ, quæ e ſingulis proximorum duorum conjugationibus erutæ ſunt, hic ſubjeci; atque una altitudines poli ex iiſdem obſervationibus deductas, & mox uſui futuras adſcripſi.



Solſtitia obſervata	*Obliq. eclipt.* G l ll	*Lat. ad D. Petr.* G l ll
Æſtivum & hybernum 1656	23. 29. 2	44. 29. 22
Æſtivum & hybernum 1658	23. 28. 54	44. 29. 18
Æſtivum & hybernum 1663	23. 28. 44	44. 29. 16
Hybernum 1666 æſtivum 1667	23. 28. 54	44. 29. 12
Æſtivum & hybernum 1667	23. 28. 58	44. 29. 16
Hybernum 1667 æſtivum 1668	23. 29. 2	44. 29. 12
Æſtivum & hybernum 1668	23. 29. 0	44. 29. 10
Hybernum 1668 æſtivum 1669	23. 28. 58	44. 29. 12
Æſtivum & hybernum 1669	23. 28. 59	44. 29. 13
Hybernum 1669 æſtivum 1670	23. 29. 2	44. 29. 11
Æſtivum 1690 hybernum 1691	23. 28. 45	44. 29. 46
Æſtivum & hybernum 1695	23. 28. 38	44. 29. 41
Æſtivum & hybernum 1697	23. 28. 34	44. 29. 37
Hybernum 1697 æſtivum 1698	23. 28. 32	44. 29. 39
Æſtivum & hybernum 1698	23. 28. 32	44. 29. 39
Hybernum 1698 æſtivum 1699	23. 28. 33	44. 29. 37
Æſtivum & hybernum 1703	23. 28. 34	44. 29. 35
Hybernum 1703 æſtivum 1704	23. 28. 35	44. 29. 33
Æſtivum & hybernum 1705	23. 28. 38	44. 29. 36
Hybernum 1706 æſtivum 1707	23. 28. 49	44. 29. 35
Æſtivum & hybernum 1707	23. 28. 46	44. 29. 32
Hybernum 1709 æſtivum 1710	23. 28. 45	44. 29. 21
Hybernum 1718 æſtivum 1719	23. 28. 28	44. 29. 30
Æſtivum & hybernum 1722	23. 28. 32	44. 29. 33
Hybernum 1722 æſtivum 1723	23. 28. 32	44. 29. 34
Æſtivum & hybernum 1725	23. 28. 46	44. 29. 31
Hybernum 1725 æſtivum 1726	23. 28. 46	44. 29. 31
Æſtivum & hybernum 1728	23. 28. 47	44. 29. 39
Hybernum 1728 æſtivum 1729	23. 28. 47	44. 29. 39
Æſtivum & hybernum 1731	23. 28. 28	44. 29. 32
Hybernum 1731 æſtivum 1732	23. 28. 26	44. 29. 34
Æſtivum & hybernum 1732	23. 28. 23	44. 29. 31
Hybernum 1732 æſtivum 1733	23. 28. 24	44. 29. 30
Æſtivum & hybernum 1733	23. 28. 26	44. 29. 32
Hybernum 1733 æſtivum 1734	23. 28. 25	44. 29. 32
Æſtivum & hybernum 1734	23. 28. 28	44. 29. 35

Poſt annum 1710 altitudines poli adauxi ſec. 14 ob libramenti vitium, anno 1722 deprehenſum. vide ſup. cap. 11.

Mihi plane hanc ſeriem percurrenti neque uniformis anguli illius imminutio, neque tamen conſtans ex vacillatione reſtitutio apparet, ac ſi quid judico, omnino res eo ſpectare videtur ut eclipticæ planum perpetua quadam oſcillatione nutet, verum inter nutandum ad æquatoris planum (ſaltem ætate hac noſtra) ſenſim accedat. Ubi enim annos haud multum inter ſe ſe diſſitos conferas

feras obliquitas modo aucta modo imminuta videtur, interdum etiam nihil quicquam diverſa deprehenditur; verum ubi majus intervallum accipitur decrementa manifeſto prævalent. Ac ne cui fallaciæ ſit quod obliquitatis menſura gr. 23. 28. 45 annis etiam haud parum diſtantibus ſæpe recurrat, trium ſaltem aut 4 ſecundorum diſcrimine, veluti annis 1663, 1691, 1707, 1725, quæ propterea quaſi vera ac perpetua ſpectari, aliiſque rejectis una ſtatui debeat, præſertim cum inter reliquas fere ſit media; ne inquam ex eo decipiamur, perpendendum eſt menſuram hanc grad. 23. 28. 45 primis a gnomone conſtructo temporibus minimam fuiſſe, poſtremis vero hiſce annis maximam reperiri earum omnium quas ecliptica libratione illa attingat; ad annum enim 1670 nuſquam angulum ad ſecunda 25 vel 30 ſupra gradus 23. 28 contractum videas, quo nunc pertingit; contra nuſquam hoc tempore ad gradus 23. 29, ut tunc, ampliari animadvertas, ut plane aliqua ejus anguli extenuatio ſit agnoſcenda.

Id ipſum autem permultis aliorum obſervationibus confirmare poſſem, veluti Flamſtedii, Bianchini, Lavalii, necnon viri nobiliſſimi Paridis Marchionis Salvaghi, qui ſinguli hoc ineunte ſæculo vel ſuperiori exeunte in rem hanc inquiſiverunt, quorum dimenſiones etſi ad unguem non reſpondent, in id tamen conſpirant ut nuſquam obliquitatem eclipticæ grad. 23. 29, ſed perpetuo minorem efficiant, cum tamen Caſſinus, Hevelius, Richerius, Hiræus qui temporibus paulo ſuperioribus obſervabant, vel graduum ipſorum 23. 29 vel aliquanto majorem conſtituiſſent; verum hoc totum a Louvillæo in illa diſſertatione præſtitum eſt. Tantum addam obliquitatis imminutionem vel ſine calculorum ſubtilitate ex hoc gnomone in vulgus notam exploratamque eſſe, quod Solaris ſpecies ellipſes illas duas, quæ ad eam per ſolſtitia excipiendam e priorum annorum obſervationibus delineatæ fuerant, nuſquam impleat ſed aliquid ejus ab iis ellipſibus extrorſum verſus æquinoctiorum loca perpetuo promineat.

An autem hæc imminutio jam inde a Pitheæ & Eratoſthenis temporibus ducenda ſit, quod Louvillæus arbitratur, an deinceps expectandum ut eodem tenore pergat, ac demum ecliptica in æquinoctialem circulum procumbat, neque definire auſim, neque mei eſt inſtituti. Certe quidquid ejus futurum eſt, ſi uſpiam alias, Bononiæ potiſſimum magni hujuſce inſtrumenti ſubſidio explorari poterit.

Caput XVI.

De exiguis altitudinis poli varietatibus hoc gnomone compertis.

Vix eſt ut ab ea indagine quam hactenus ſum proſecutus indago alia ſegregari poſſit quæ ad poli altitudinem attinet, cujus varietates, quantum eas e ſolſtitiis perſcrutari licet, in ſynopſi nuper tradita manifeſtæ ſunt. Hæ autem diverſitates vel ex eo facile arguuntur, quod dum eclipticæ inclinatio iden-

identidem mutatur, minime æqualis utriuſque tropici ad æquatorem acceſſus, vel ab eo receſſus obſervetur, ſed alteri eorum major, alteri minor, aut nullus, quinimmo interdum in diverſum mutatio accidat. Si enim quantum æſtivus tropicus a vertice receſſit tantumdem hybernus acceſſiſſet, aut illo ſe ſe attollente hic pari ſpatio depreſſus foret, nihil quicquam varia prodiret æquatoris diſtantia a vertice, quæ altitudini poli perpetuo æqualis eſt; nunc vero ſecus contingere e diſtantiarum tropicarum ſerie ſupra poſita liquet, ſi ejus numeri diligenter inter ſe ſe conferantur. Nam ut unum in plurimis exemplum afferam, apparet diſtantiam a vertice tropici Cancri, quæ anno 1658 fuerat gr. 21. 0. 24, anno 1697 fuiſſe gr. 21. 1. 3 ac propterea augmentum eo tempore ſuſcepiſſe ſecundorum 39; cum tamen diſtantia tropici Capricorni, quæ anno 1658 inventa fuerat gr. 67. 58. 12, nullo vel inſenſili decremento comperta ſit anno 1697 grad. 67. 58. 11; contra ex anno 1697 ad 1709 vel 1710 diſtantia a vertice tropici Cancri contracta eſt ſecundis 27, Capricorni vero adeo non tantumdem eſt adaucta, ut etiam ſecundis 6 imminuta fuerit. Ex hoc ergo neceſſario conſequitur æquinoctialis circuli, quippe medio inter tropicos loco conſtituti, poſitum identidem alium reperiri.

Ne autem iterum in obſervationum incertitudinem hæc diſſidia rejiciamus perpendendum eſt ea quidem exigua cenſeri poſſe ſi ad ea referantur quæ in altitudine poli minoribus inſtrumentis inveſtiganda conſurgere ſolent, ſecus ſi ea ſubtilitas ſpectetur quam maximus hic gnomon præſtare poteſt. Minima enim latitudo omnium quæ inventæ fuerint, ea nempe quæ prodiit anno 1670 gr. 44.29.11, ſecundis 35 differt a maxima quæ in annum 1691 convenit gr. 44 29. 46, majori ſane diſcrimine quam ut ſedulum hoc inſtrumento obſervatorem fallat, præſertim cum ſingulis fere annis tropicæ hæ diſtantiæ e plurium dierum obſervationibus mediæ electæ fuerint, ac præterea errores ſi qui ſunt, cum rationes ſubducuntur nonniſi dimidii ſupereſſe poſſint, quod ad latitudinem conflandam dimidium tantum tropicorum intercapedinis in ſummam imputetur, ut taceam latitudinum quæ ad ſingulos annos deductæ ſunt (præſertim ex anno 1656 ad 1670) decrementa ordinem quemdam ſervare, iterumque ex anno 1691 ad 1710 haud diſſimili lege progredi, quæ ſane nihil vagum ac fortuitum quod in obſervando contingat, ſed certum quiddam ac conſtans præſeferre videntur, quod ſive in verticalis puncti poſitu, ſive in ipſis polis ac mundi axe agnoſcendum ſit.

Sed quando prioribus illis annis latitudo e ſolſtitiis eruta eadem e ſtella polari ſummo conſenſu eliciebatur, tentandum exiſtimavi an ejus mutationes, quas ſolſtitiales altitudines proderent, ſtellarum quoque teſtimonio confirmarentur. Equidem ut in ipſis Divi Petronii ædibus id experiri liceat peculiare inſtrumentum Caſſini ac Gulielmini cura conſtructum fuerat anno 1695, ac deinceps in hoſce uſus ſervatum, cujus inſtrumenti deſcriptio una cum gnomonis hiſtoria eodem anno eſt edita, ac ſane ejus ope ſtellarum altitudines eadem ſubtilitate definire licet qua Solis poſitum ex hac linea arguimus, verum uſus nonnihil eſt operoſus. Stella enim meridianum pertranſiens per pinnulam aut teleſcopium machinæ aptatum inde ſpectanda eſt unde regularum duarum in ſublimi poſitarum, quarum altera verticalis eſt, horizontalis altera, angulum diſtrin-

diſtringere videatur, quod cum noctu peragendum ſit neceſſe eſt ut angulus ille lumine ſatis vivido colluſtretur, id quod nonniſi tabulatis ſubſtructis, ſcaliſque prælongis admotis aſſequi licet, quod borealis ædium feneſtra, cui regulæ illæ ſunt appoſitæ, pedes amplius 75 a pavimento attollatur. Ut hoc incommodi evitarem eos anni dies captabam quibus ſtella polaris in ipſa crepuſculi luce ad meridianum appelleret, verum cum fieri nequeat ut eadem anni tempeſtate uterque ejus tranſitus in crepuſculum incidat, obſervatio de altera duarum altitudinum meridianarum peracta cum ea componenda erat quæ alia tempeſtate de altera haberetur, id quod propter ſtellæ evagationes fallax eſſe poterat; itaque cum in eo mihi non ſatisfacerem indaginem hanc dimiſi, & alibi tentandum duxi.

Anno igitur 1703 menſe Decembri in obſervatorio domeſtico Aloyſii Ferdinandi Comitis Marſilii, viri de optimis diſciplinis præclare meriti, altitudinem poli ejus loci ita cum Stancario definivi quadrante cujus radius pedum Bononienſium trium:

Diſtantia a vertice ſtellæ polaris in parte ſuperiori meridiani plurium dierum obſervationibus inventa	gr. 43. 12. 42
Diſtantia ejuſdem in parte inferiori meridiani per eaſdem noctes bis obſervata	gr. 47. 46. 26
Differentia	gr. 4. 33. 44
Differentiæ dimidium ſeu diſtantia ſtellæ a polo boreo	gr. 2. 16. 52
Ergo apparens diſtantia poli a vertice	gr. 45. 29. 34
Refractio Caſſiniana addenda	1. 0
Diſtantia vera poli a vertice	gr. 45. 30. 34
Et vera poli altitudo in obſervatorio Marſiliano	gr. 44. 29. 26
Obſervatorium hoc ex menſuris geodeticis hoc anno 1735 accurate actis auſtralius eſt æde Divi Petronii in ipſo perpendiculi puncto decempedis Bononienſibus 63 nempe ſecundis circuli maxime fere	8
Ergo vera altitudo poli ad D. Petronii anno 1703	gr. 44. 29. 34
quæ ex obſervationibus ſolſtitialibus ejuſdem anni eruta fuerat	gr. 44. 29. 35

Idem inveſtigavimus anno 1706 menſibus Octobri ac Novembri per ſtellam alia circumpolarem, eamque inſignem Urſæ majoris in humero, quæ Bayero *α* notatur; utebamur autem ſemicirculo murali cujus radius pedum Bononienſium 4.

Altitudo apparens ſtellæ in parte ſuperiori experimentis tribus inventa	gr. 71. 10. 49
Refractio ſubtrahenda ex Caſſini tabula	20

Alti-

Altitudo ſuperior vera	gr. 71.10.29
In parte vero inferiori altitudo apparens ex obſervationibus quatuor	gr. 17.51.34
Refractio Caſſiniana ſubtrahenda	gr. 3. 2
Altitudo inferior vera	gr. 17.48.32
Altitudinum verarum differentia	gr. 53.21.57
Semidifferentia	gr. 26.40.58
Elevatio vera poli in obſervatorio Marſiliano	gr. 44.29.30
Differentia parallelorum ut ſupra addenda	8
Ergo elevatio poli in Divi Petronii anno 1706	gr. 44.29.38
Ex obſervationibus ſolſtitialibus inventa ibi fuerat anno 1705	gr. 44.29.36
Anno autem 1707	gr. 44.29.35

Præterea eodem anno 1706 quamplurimas ſtellarum aliarum circumpolarium obſervationes eodem inſtrumento murali peregimus menſibus Octobri, Novembri, ac Decembri, e quibus ſingulis altitudinem poli in obſervatorio Marſiliano eruimus non majorem grad. 44. 29. 56, nec minorem gr. 44. 29. 8, mediam vero inter omnes definivimus grad. 44. 29. 35, atque in eam altitudinis menſuram e duabus ſupra viginti ſtellis quatuordecim ita conſpirant, ut ab ea nonnullæ per defectum, aliæ per exceſſum plus ſecundis 10 non diſſideant, cui quidem mediæ menſuræ reſpondent ad Divi Petronii gr. 44. 29. 43; unde illud ſaltem manifeſto evincitur earum ædium latitudinem anno 1706 majorem fuiſſe quam Caſſinus ac Ricciolius tam miro conſenſu anno 1656 invenerant, ac ſolſtitiales ejuſdem anni altitudines confirmaverant, grad. nempe 44 29. 22. Quod autem inſtrumento eodem murali polaris ſtella reliquis non reſponderit (quippe quæ latitudinem exhibuit in obſervatorio gr. 44. 30. 13) id ſcilicet in cauſa fuiſſe arbitror quod inſtrumenti planum meridiani plano exacte non congrueret, ac præterea filum, quod in foco teleſcopii horizontis plano æquidiſtans ſtatui debet, eum poſitum exquiſite non ſervaret; quæ duo, ubi immotis inſtrumentis utimur, niſi maxima cura proſpecta ſint, diſſidia haud ſpernenda in iis ſtellis efficere poſſunt, quæ circuitus anguſtiores circa polum deſcribunt.

Denique anno 1728 eandem indaginem aggreſſi ſumus in publico obſervatorio Bononienſis ſcientiarum inſtituti; utebamur autem & ſemicirculo & quadrante eodem quo anno 1703, ac alio præterea quadrante tripedali, quem maximus optimorum ſtudiorum & patronus & cultor Alexander Cardinalis Albanus obſervatorio dono dederat, quæ inſtrumenta ſingula ex recenti ſummo ſtudio a nobis ſeorſim expenſa, ac ad rectam conſtitutionem redacta fuerant. Cum autem omnia una tractanda eſſent, officia mecum partiebantur Franciſcus Zanottus, Jo: Jacobus Parma, Joſeph Bolſius Marcheſius, Franciſcus

ciſcus Vandellius, Franciſcus Algarottus, Euſtachius Zanottus. De altitudinibus tamen ſemicirculo murali captatis nihil exacti ſpondere auſim pluribus de cauſis, ſed computi ſumma eodem cum aliis inſtrumentis recidit.

	Quadrante Albaniano G ′ ″	*Quadrante Marſiliano* G ′ ″	*Semicirculo murali* G ′ ″
Altit.max.ſtellæ Pol.Nov.& Dec.1728 pluries	46.39.10	46.39.12	46.39.35
Ejuſdem altitudo minima Decembri	42.22.35	42.22.30	42.22.10
Differentia altitudinum	4.16.35	4.16.42	4.17.25
Semidifferentia ſeu diſt. ſtellæ a polo boreo	2. 8.17	2. 8.21	2. 8.42
Unde altitud.poli apparens in obſerv. publico	44.30.52	44.30.51	44.30.52
Refractio Caſſiniana ſubtrahenda	1. 0	1. 0	1. 0
Vera altitudo in obſervatorio publico	44.29.52	44.29.51	44.29.52
Ex menſuris geodeticis anno 1735 peractis locus perpendiculi in D. Petronii auſtralior eſt obſervatorio	14	14	14
Ergo vera altit.poli ad D.Petronii anno 1728	44.29.38	44.29.37	44.29.38
Ex obſervationibus ſolſtitiorum ejuſdem anni 1728 arguitur latitudo ad D. Petronii	44.29.39	44.29.39	44.29.39

Hæ igitur obſervationes, juxta atque aliæ ſuperius allatæ eaſdem fere poli altitudines reſtituunt quæ per eadem tempora e ſolſtitiis eruuntur, earumque rectitudinem confirmant; ac illud prætera oſtendunt correctionem a vitiato lineæ libramento in locis ſaltem ſolſtitiorum haud male reſpondere, tametſi vitia illa in regula tantum ferrea explorata fuerant, & ab eo experimento anni jam plures abjerunt. Quæ cum ita ſint, ſtatui poſſe videtur latitudinem minime conſtantem eſſe, ſed incrementa aut decrementa ut ut exigua interdum ſuſcipere; id enim ut vel invitus agnoſcerem tot ac tam diverſarum obſervationum conſenſus a me extorſit: neſcio an & aliis perſuadebit.

Quo autem minus inopinatum id accidat faciunt plurium ſuperioris ævi aſtronomorum teſtimonia, necnon Caſſini ipſius judicium, cujus diſſertationem de eo argumento anno 1693 editam ſuperiori capite memoravimus. Is enim poſt plurimas, cum ſuas tum aliorum obſervationes de ſtella polari relatas, atque expenſas oſtendit latitudinis diverſitatem eodem in loco interdum ad minuta duo exurgere; neve hoc diſtantiæ ſtellæ a polo tribui poſſit, quæ diſtantia ob ſtellæ aberrationes adhuc incompertas, perperam aſſumpta fuerit, in ſingulis obſervationibus illis quas affert utraque ſtellæ altitudo meridiana notata fuerat atque exinde latitudo elicita. Itaque Bononienſem latitudinem nonnihil mutatam adeo non mirari debemus, ut imo liberaliter nobiſcum actum exiſtimandum ſit, quod variatio longe infra minuta illa duo ha-

ctenus conſtiterit, quippe quæ tertiam præterpropter minuti partem non exceſſerit, ſi medias ſingulorum temporum menſuras ſpectemus, id quod fortaſſe inſtrumenti hujuſce magnitudini ac obſervationum ſubtilitati tribui poteſt.

Non eſt mihi reticendum quod Jacobus Caſſinus in itinere Italico retulit, ac Caſſinus quoque Pater in deſcriptione meridianæ hujus lineæ indicaverat: Bononiæ latitudinem anno 1694 die 30 Decembris ex ſtella polari octante aſtronomico a ſe definitam grad. 44. 30. 17, iterumque die 1. Novembris 1695 gr. 44. 30. 39, ac denique die 7 Novembris eo inſtrumento cujus ſupra meminimus inventam cum Gulielmino ad Divi Petronii gr. 44. 30. 21, cui determinationi utpote fere mediæ adhærendum arbitratur; etſi autem hæc latitudo ſecundis 40 eam excedit quam anno eodem 1695 e ſolſtitiis erutam in ſynopſi tradidimus gr. 44. 29. 41, tamen confirmari ſaltem ex eo videtur majorem tunc fuiſſe quam anno 1656, quo graduum 44. 29. 22 taxata fuerat. Ceterum cum in illis obſervationibus altitudo ſtellæ in parte tantum ſuperiori explorata fuerit, ac modo ex comparatione cum ea quæ in Pariſienſi obſervatorio notabatur, modo ex aſſumpta ſtellæ a polo diſtantia latitudines ſint elicitæ, res ex hiſce obſervationibus ſubtiliſſime conſtituta non videtur.

Qua porro ratione enarratæ hactenus diverſitates explicari queant, an ſcilicet verticalis potius lineæ detorſioni ex telluris figura fortaſſe mutabili ortæ, quam terreſtris axis trepidationi, aut turbinationi tribuendæ ſint (id quod ab aliqua meridianorum terreſtrium luxatione diſiunctum eſſe non poſſet) aliis perpendendum relinquo. Quouſque enim plurimæ obſervationes & hic, & alibi actæ certas harum viciſſitudinum, ſi modo ullæ ſunt, menſuras, ac leges non prodant, nil niſi figmenta, ac divinationes afferre licet.

CAPUT XVII.

De tabulis Solaribus harum obſervationum ope primum accurate confectis.

NEque locum Solis in meridiano ſine refractionum ac parallaxeon notitia inveniri, neque ex eo invento ſine poli altitudine atque eclipticæ obliquitate poſitum in Zodiaco inveſtigari poſſe ſupra diximus. Sunt ergo hæc quatuor ſupputationum omnium quæ ad Solem, atque adeo ad planetas ceteraſque ſtellas ſpectant, fundamenta, ac aſtronomici computi quaſi elementa quædam, quæ ſane quam accurate ex hoc gnomone conſtituta fuerint hactenus declaravimus. Verum ad ipſum Solis motum penitus intelligendum ac certis numeris adſtringendum non ſat eſt plurimas ejus in ecliptica poſitiones inveniſſe. Arte præterea ac ſolertia opus eſt quo motus ille, quem inæqualem eſſe ſtatim apparet ex æqualitate quapiam derivari, ejuſque celeritatum leges, menſuræ, termini præfiniri queant.

Veteres aſtronomi cum perſuaſione quadam ducti nullum in cælis motum niſi circularem & æquabilem agnoſcerent eam omnem inæqualitatem quæ in Sole obſer-

obſervatur opticam arbitrabantur, ac ex eo profectam quod tellus ab ejus circuli centro nonnihil abeſſet, quem circulum Sol æquabili motu deſcriberet; ex ea enim hypoteſi fiebat ut circuli illius partes tametſi æquales nihilominus viſui noſtro inæqualiter objectæ angulis minime paribus aſpicerentur, quibus angulis ſtellarum motus metimur. Hanc quidem cauſam, obſervationibus non valde accuratis decepti, Solaribus anomaliis explicandis ſatis aptam rebantur, verum ubi ad planetas alios ventum erat, cum eam non æque ſatisfacere perſpexiſſent aliud præterea centrum comminiſcebantur, ad quod ſi planetæ motus referretur æquabilis eſſet, tametſi planeta in circulo ſuo inæqualiter procederet; itaque hypoteſim illam æquabilitatis verbo tenus ſervabant, re autem ipſa tollendam agnoſcebant, cum opticæ inæqualitati phyſicam adjungi opus eſſet quo planetarum motus explicarentur.

Keplerus circularem figuram, quo phœnomena ſalva eſſent, antiquandam, ac ellipſim ſubrogandam, æqualitatem vero minime in arcubus aut angulis ſed in areis ſpectandam opinatus eſt, atque id de ſtella Martis ac de errantibus pleriſque aliis, aſtronomis pene omnibus perſuaſit; de Sole autem res adhuc agitabatur cum Caſſinus gnomone hoc conſtructo controverſiæ dirimendæ facultatem ſibi oblatam exiſtimavit. Si enim nulla niſi apparens inæqualitas Soli obtingeret neceſſe erat celeritatem ejus augeri pro eo fere ac diſtantia minueretur; cum ergo & apparens magnitudo eadem proportione diſtantiis reſpondere debeat, conſequens erat ut celeritatum ratio diametrorum apparentium rationem ſequeretur; quod an ita eſſet hoc inſtrumento certiſſime exploratum iri cenſuit, quo & diametri Solis quotidie menſuris comprehendi poſſent, & celeritates e duorum, aut plurium continentium dierum longitudinibus argui. Itaque cum multa ejuſcemodi experimenta cæpiſſet, non modo aſſumptionis illius falſitatem agnovit ſed celeritatum rationem diametrorum duplicatam eſſe comperit, quod in Keplerianam arearum æqualitatem mirifice quadrabat. Mirum eſt autem hanc celeritatum legem ac proportionem, quæ aliis ſubinde aſtronomis eadem inventa eſt, accurate adeo perſpici illi potuiſſe e ſolaribus diametris, cum diametri ipſæ, quippe ex hoc inſtrumento definitæ, minime accuratæ eſſent, quemadmodum capite 4 declaravimus; ſed fors tulit ut in iis quibus uſus eſt obſervationibus diametri quamquam veris minores veram tamen harum rationem ſervarent. Quanti autem momenti res hæc ad aſtronomiam eſſet vel ex eo intelligere licet quod diſtantia centri Solaris orbitæ a tellure duplo inde minor prodiret quam ubi inæqualitas omnis tantummodo apparens eſſet, ac propterea diſtantia Solis appogæa ſupra perigæam ſemiſſe tantum ejus differentiæ augeretur qua in illa hypoteſi augenda fuerat, unde & aliarum omnium diſtantiarum extra apſides mira varietas conſurgebat, qua ignorata ne aliorum quidem planetarum ad tellurem poſitus cognoſci poterant.

Hiſce ergo fundamentis Caſſinus anno 1660 ſolares tabulas ſuas ſuperſtruxit, prioribus tabulis antiquatis quas ante refractiones inventas adornaverat. In iis conſtruendis ellipticam Solaris orbitæ figuram cum Keplero retinuit; ſed cum in hypoteſi ipſa Kepleriana de arearum æqualitate valde operoſa eſſet Solaris anomaliæ per annum diſtributio, ac multo etiam difficilior apogæi in-

ventio, ac ſpeciei ellipſeos determinatio, compertum autem eſſet ſi pro areis anguli in alio ellipſeos umbilico (quorum umbilicorum alterum Terra occupat) tempori proportionales ponerentur, futurum ut pene eadem toto anno Solis longitudo prodiret, in hanc hypoteſim eſt delapſus, cui & Sethus Vuardus in Anglia, & Comes Paganus in Gallia adhæſerunt, atque in ea hypoteſi problema illud difficillimum de ellipſeos ſpecie ejuſque axis poſitione e tribus aut pluribus obſervationibus determinanda primus elegantiſſime ſolvit, cujus ſolutionis demonſtratio a Jacobo filio edita nuper eſt in commentariis academiæ Pariſienſis anni 1723.

Has itaque omnium primas toto anno Soli reſpondentes tabulas aſtronomia habuit, neque enim aut Philolaicæ Bullialdi, aut Bononienſes Ricciolii, aut Rudolphinæ ipſæ Kepleri, quamquam eidem aut parum diverſæ hypoteſi aptatæ eſſent (quod antea fuerant nullæ) ſat exquiſite præſtare id poterant, quippe quæ ex obſervationibus minime a refractionum fallacia caſtigatis, atque adeo falſis concinnatæ fuerant. Eas tamen tabulas Caſſinus nuſquam edidit, ſed Malvaſiæ, Montanario, Graſſino, Fabrio, Mezzavaccæ aliiſque nonnullis tradidit, indeque ephemerides Solis ex anno *1661* ſupputari cæptæ. Tanta autem erat earum ephemeridum cum cælo conſenſio, ut quoties puncta duo in hac meridiana linea notarentur, quæ puncta ab utroque ſpeciei margine attingenda ephemerides indicarent, nuſquam prædictio falleret. Id uti ſæpius fieret Caſſinus Montanarium rogaverat per eam epiſtolam quæ ephemeridi Montanarii anni *1666* eſt adjecta, quo videlicet eorum ſermones obtunderet qui & novas refractiones ab ipſo invectas cavillabantur, & tabulas alias præ Caſſinianis extollebant; ac ſane id ſæpius factum, præſertim anno *1669*, ac experimenta a Caſſini tabulis ſtetiſſe Fabrii autographa teſtantur.

Eundem eventum obſervationes aliæ ſortitæ ſunt quas annis *1672*, & *1673* in inſula Cayenna peregit Richerius; cum enim ejus inſulæ meridianum a Bononienſi horis 4. 21 in occaſum abire compertum eſſet, Sol autem intervallo annorum Julianorum novem horis ipſis 4. 21 ſerius ad idem Zodiaci punctum revertatur, fiebat ut annis illis duobus quoties Sol ad inſulæ meridianum appelleret eandem adamuſſim longitudinem haberet quam ante annos novem, annis ſcilicet *1663* & *1664* iiſdem diebus in meridiano Bononiæ habuerat, quibus annis extabant Caſſinianæ ephemerides Bononienſi meridiano a Malvaſia aptatæ. Earum ergo Ephemeridum numeros Richerianæ obſervationes a refractionibus exſolutæ plerumque tam exſquiſite repræſentabant, quam optari poſſet; ac ſi interdum pluſculum ab iis deſciſcerent, obſervationum ipſarum ordo vitio habitas palam faciebat.

Ceterum cum e paucorum annorum obſervationibus neque medius Solis motus, neque apogæi progreſſus ſatis exploratus eſſe poſſet, ac præterea perdifficile eſſet in taxanda maxima Solis inæqualitate ne ſolido quidem minuto decipi (quod errorculi in diſtantiis a vertice inter obſervandum admiſſi ut minimum triplo fere in longitudinibus exſcreſcant) Caſſinus nonnulla poſtmodum in tabulis illis expolienda agnovit, quod ejus ad me literæ die 13 Septembris *1699* Lutetia datæ teſtantur, motum enim medium Solis quarto quo-

vis

vis anno ſecundis tribus a ſe adauctum, ejuſque inæqualitatem minuti ſemiſſe ſucciſam memorant. Has ego tabulas poſt ſupremam illis manum impoſitam anno 1711 per Maraldum accepi, deinde vero a Fevillæo ſecundo volumine itinerum anno 1714 editas vidi. In iis ſemidiametri Solis quæ cuilibet anomaliæ gradui reſpondent, ellipticæ orbis figuræ aptatæ ſunt, quod ſecus erat in alia ſemidiametrorum Solarium tabula quam Caſſinus ipſe ad denos anni dies ex obſervationibus teleſcopio habitis concinnaverat, ac in elementis aſtronomiæ ediderat. Ex his porro tabulis deprompta hactenus ſunt ephemerides illæ quas in uſum Bononienſis obſervatorii ab anno 1715 inchoatas in annum 1725 perduxi, alii vero mecum ad 1750 protulerunt. Denique hoc ipſo anno 1735 qui annus dum hæc conſcriberem obrepſit, egregius juvenis Jo: Dominicus Maraldus, Jacobo Philippo patruo in regia academia Pariſienſi ſuffectus ex iiſdem tabulis ephemeridem illam edere cæpit quæ *notitia temporum* inſcribitur, ac quotannis ejuſdem academiæ mandato vulgatur.

Neque tamen interea in perveſtigando Solis motu exterorum ceſſavit induſtria. Anno etenim 1661 prodierunt Thomæ Streetii Angli aſtronomicæ tabulæ (Carolinas appellavit) quas iterum anno 1705 una cum calculorum præceptis latine redditis Norimbergæ edidit Joannes Gabriel Doppelmayerus, vir de hiſce ſtudiis præclare meritus. Flamſteedius etiam in ea quæ Horoccii operibus inſerta eſt diſſertatione de dierum inæqualitate canones ſolares ſuos anno 1672 evulgavit; Philippus vero Hiræus anno 1686 Solares & ipſe cum Lunaribus protulit, quibus reliquorum deinde planetarum tabulas, multorum annorum obſervationibus elaboratas adjunxit, ac problematis pluribus qua ſupputandi qua obſervandi artem mire perficientibus exornavit. Adhæc anno 1690 ab accuratiſſimo cæli obſervatore Joanne Hevelio Conſule Gedanenſi emiſſus eſt aſtronomiæ prodromus, in quo Solis curſum numeris & ipſe ſubjecit. Teruntur præterea calculatorum manibus inſignis apud Anglos mathematici Gulielmi Viſthoni tabulæ in publicum editæ anno 1707, quarum numeros ad Solem ſpectantes e Streetianis ac Flamſteedianis a ſe correctis deductos teſtatur. Sed & vir nobiliſſimus Joannes Philippus Vurzelbau Norimbergæ, in civitate hiſce ſtudiis celeberrima ſolares ſuos canones protulit anno 1719, quos Noricos inde appellavit. Summi vero philoſophi atque aſtronomi Equitis Neutoni Solares rationes juxta cum Lunaribus dum a præſtantiſſimo Halleyo tabulis digeſtas expectamus, fecit ut deſiderium hoc æquius ferre liceat eximius & ipſe aſtronomus Nicaſius Grammaticus Soc. Jeſu, ex quo planetam utrumque ad Neutoni mentem paucis pagellis, Ingolſtadii anno 1726 editis, comprehendit. Denique Louvillæus novos ſolares numeros a ſe ſe concinnatos Pariſienſis academiæ commentariis inſeruit anno 1720.

Quænam autem e tot aſtronomorum tabulis exquiſitius cælo reſpondeant judicare neque mei eſt inſtituti, & immenſæ foret operæ, præſertim cum propter multa quæ ad earum conſtructionem aſſumenda ſunt elementa fere contingat ut & aliis annis, & aliis ejuſdem anni diebus aliæ aliis præſtare videantur; ac plerumque adeo modica ſint quarumdam inter ſe ſe diſſidia (quod in Caſſinianis præſertim, Hiræanis, ac Neutonianis accidere animadverti) ut obſervationum, vel maximo hocce inſtrumento habitarum, ſubtilitatem eludant.

Adhæc

Adhæc quo de ſingularum fide judicium ferre liceret, obſervationes ipſæ a refractionibus ad ſingulorum auctorum præſcriptum purgandæ forent, & eclipticæ obliquitas, necnon loci latitudo ex iiſdem refractionibus conſtituenda, quod infinitum pene eſſet. Mihi quid meridiana hæc linea ad Solarem motum longe accuratius quam a veteribus factum erat explorandum, ac numeris comprehendendum, ipſamque adeo aſtronomiam reſtituendam contulerit, ſat eſt hactenus declaraſſe. Quid autem ad ſummam in ea re ſubtilitatem attingendam conferre adhuc poſſit proximo capite aggrediar.

CAPUT XVIII.

De Æquinoctiis definiendis, deque anni tropici quantitate conſtituenda.

HAud ſatis officio ſe feciſſe aſtronomi arbitrantur ubi numeris ſuis planetæ cujuſpiam motum accurate repræſentaverint, niſi & perpetuo repræſentent, aut certe, quando hominibus perpetuitatem ſpectare ambitioſum ac pene improbum videri poteſt, eorum numerorum uſum ad longiſſima ſaltem ante ac poſt tempora non proferant. Id autem aſſequi non unius hominis opus eſt ſi a propriis tantum experimentis inſtructus rem ſibi conficiendam ſumat. Fac enim planetariæ orbitæ figuram ejuſque poſitum annorum aliquot obſervationibus exquiſite conſtitutum; fac in ea orbita motus legem, omnemque inæqualitatum viciſſitudinem certiſſime exploratam; fac demum neque orbitæ dimenſiones, neque ejus centri ad tellurem poſitum uſquam deinceps immutandum; tamen cum fieri nequeat ut tempus illud quo planeta converſionem ſuam abſolvit paucis illis annis ad minima uſque & inſenſilia ſcrupula taxatum fuerit, ac multo minus ut lineæ apſidum motus, quem aliquem eſſe conſtat, accuratiſſime ſit compertus, neceſſe eſt ut errores qui initio ſenſum omnem effugerant multorum denique annorum lapſu coacervati ſe ſe prodant, ac tabulæ paulatim a cælo deſciſcant. Itaque aſtronomorum omnium ſententia duo hæc, nimirum planetæ periodus, quam periodum quum de Sole quæſtio eſt annum vertentem, ſeu tropicum appellamus, & apogæi motus non aliunde quam ab obſervationibus hominum memoriam tranſcendentibus repetenda earumque cum recentioribus collatione inveſtiganda ſunt. Etſi autem quo longius experimenta ducuntur eo ad hanc indaginem aptiora exiſtimantur, tamen ea fuit veterum in obſervationibus peragendis indiligentia, contra earum quæ hoc inſtrumento habentur tanta eſt ſubtilitas, ut parum abſit quin horum octoginta annorum ſpatio paria cum illis præſtare poſſint, quæ inde a primis aſtronomiæ temporibus ad nos manarunt.

Solent autem aſtronomi anni tropici quantitatem per æquinoctiorum præſertim obſervationes exquirere, tum quod ad hoc nihil neceſſe ſit eclipticæ obliquitatem, ſed tantum loci latitudinem præноſci, tum quod per æquinoctii tempus diurna Solaris declinationis variatio valde manifeſta ſit, quippe quæ ad minu-

minuta fere 24 exſurgat, ac propterea exigui inter obſervandum errores eam indaginem haud valde turbare poſſint. Accedit quod æquinoctia ætate noſtra prope medias a linea abſidum elongationes incidant, ubi cum æquatio Solis ex apogæi motu plurimis annis perparum mutetur, fit ut linea veri motus pari fere tempore ac linea motus medii converſionem ſuam abſolvat, ac annus tropicus verus anno tropico medio (cujus præſertim quantitas inveſtiganda eſt) fere ad unguem exæquetur.

Æquinoctiorum porro tempora qua ratione ex obſervationibus eruantur vulgo eſt notiſſimum. In ſingula enim minuta declinationis meridie inventæ, quum Sol unum vel alterum circiter diem ab æquinoctio diſtat, hora una tribuitur, in ſingula vero ſecunda minutum unum, atque ita tempus conflatur quo æquinoctium ante vel poſt meridiem illum commiſſum eſt. Accuratius tamen tempus elicitur ſi ubi de verno æquinoctio agatur minutis 23. 41, aut ubi de autumnali minutis 23.28 horæ 24 tribuantur, atque ex ea proportione computus ineatur, tantum enim ævo noſtro declinationes prope æquinoctiorum articulos dietim variari multorum annorum experimenta evincunt.

Hoc igitur pacto æquinoctia cum verna tum autumnalia omnia, quotquot ex hiſce Bononienſibus obſervationibus a gnomone conſtructo in hunc diem deduci poterant, computavi, eorumque ſeriem hic ſubjeci; qua in re eas ut plurimum obſervationes ſelegi quarum tempora quamminimum ab æquinoctio diſtabant, nihil moratus ſi aliorum dierum proximorum numeri æquinoctii momentum nonnihil diverſum exhiberent. Advertendum eſt autem me in ſingulis æquinoctiis indagandis eas aſſumpſiſſe poli altitudines quæ ab ejuſdem vel a proximorum annorum obſervationibus ſolſtitialibus eruebantur, quas altitudines ante tradidi capite 15; niſi quod poſt annum 1700 cum parum quiddam diſcriminis in eo eſſet, piguit me ſingulis annis altitudinem aliam ponere, ac ſatius duxi mediam eligere gr. 44. 29. 35.

Ad hæc cum inſtrumenti examen anno 1722 habitum diſtantias omnes a vertice circa æquinoctia (nempe in locis centeſimarum 97 & 99 perpendiculi) ſecundis præterpropter 15 ob vitiatum lineæ libramentum augendas oſtenderet, nec vero liqueret quo tempore id vitii inſtrumento accidiſſet, ac mihi veroſimile fieret non id repente ſed paulatim obrepſiſſe, correctionem nonniſi poſt annum 1715 adhibendam ſum arbitratus, eandemque ad poſtremos hoſce annos retinui, quod ejus vel omittendæ, vel immutandæ nulla eſſet cauſa.

Ubicumque autem duo aut plura ſibi proxime ſuccedentia æquinoctia occurrerent, temporis intervallum quod inter ea intercederet adſcripſi. Sunt autem tempora hæc omnia apparentia, ſeu vera, quæ facile in media converti poſſunt.

Altit. poli in ſingulis æquinoctiis ad calculos aſſumpta G	I	II	*Æquinoctiorum tempora*		H	I	*Æquinoctiorū proximorum intervalla.* D	H	I
44	29	22	1655	22 Sept.	17	11	178	18	20
			1656	19 Mar.	11	31	186	11	42
			1656	21 Sept.	23	13	178	17	31
44	29	20	1657	19 Mar.	16	44			
44	29	18	1658	19 Mar.	23	44			
44	29	14	1666	19 Mar.	21	16	186	12	54
			1666	22 Sept.	10	10			
44	29	12	1668	21 Sept.	21	32	178	17	7
			1669	19 Mar.	14	39			
44	29	11	1670	19 Mar.	20	50	186	12	1
			1670	22 Sept.	8	51			
44	29	11	1672	19 Mar.	8	11	186	12	18
			1672	21 Sept.	20	29			
44	29	11	1674	19 Mar.	19	35			
44	29	11	1676	19 Mar.	7	15			
44	29	11	1679	20 Mar.	1	15			
44	29	46	1690	22 Sept.	4	44			
44	29	41	1695	19 Mar.	21	58	186	11	57
			1695	22 Sept.	9	55	178	17	48
44	29	40	1696	19 Mar.	3	43	186	12	11
			1696	21 Sept.	15	54			
44	29	39	1697	21 Sept.	21	41	178	17	37
44	29	39	1698	19 Mar.	15	18	186	12	24
			1698	22 Sept.	3	42	178	17	23
44	29	37	1699	19 Mar.	21	5	186	12	21
			1699	22 Sept.	9	26	178	17	46
44	29	35	1700	20 Mar.	3	12	186	12	1
			1700	22 Sept.	15	13	178	17	22
			1701	20 Mar.	8	35	186	12	35
			1701	22 Sept.	21	10	178	17	38
			1702	20 Mar.	14	48	186	11	55
			1702	23 Sept.	2	43	178	17	49
			1703	20 Mar.	20	32	186	11	58
			1703	23 Sept.	8	30	178	17	54
			1704	20 Mar.	2	24	186	12	24
			1704	22 Sept.	14	48			
			1705	22 Sept.	20	32	178	17	15
			1706	20 Mar.	13	47	186	12	28
			1706	23 Sept.	2	15			
			1707	23 Sept.	7	50			
			1708	22 Sept.	13	44			
			1710	20 Mar.	13	0			
			1711	23 Sept.	7	14	178	17	9
			1712	20 Mar.	0	23			
			1714	23 Sept.	0	37			
			1715	23 Sept.	6	33			

Deinceps obſervationibus correctionem ante memoratam adhibui, altitudinem autem poli retinui gr. 44. 29. 35

		H	I	D	H	I
1719	23 Sept.	5	47			
1722	22 Sept.	17	17	178	17	47
1722	20 Mar.	11	4	186	12	8
1722	22 Sept.	23	12	178	17	41
1723	20 Mar.	16	53	185	12	3
1723	23 Sept.	4	56	178	17	42
1724	19 Mar.	22	38	186	12	0
1724	22 Sept.	10	38	178	17	38
1725	20 Mar.	4	16			
1726	20 Mar.	10	9	186	12	13
1726	22 Sept.	22	22	178	17	43
1727	20 Mar.	16	5	186	12	2
1727	23 Sept.	4	7	178	17	32
1728	19 Mar.	21	39	186	11	54
1728	22 Sept.	9	33			
1730	22 Sept.	21	25	178	17	47
1731	20 Mar.	15	12	186	12	11
1731	23 Sept.	3	23	178	17	46
1732	19 Mar.	21	9	186	12	4
1732	22 Sept.	9	13			
1733	22 Sept.	15	5	178	17	49
1734	20 Mar.	8	54	186	12	4
1734	22 Sept.	20	58			

Qui

Qui diligenter hanc ſeriem perpenderit haud difficulter certiores obſervationes a minus certis diſtinguet, nec ſine earum delectu inveſtigationem anni tropici aggredietur; cui rei adſcripta æquinoctiorum intervalla uſui in primis eſſe poſſunt. Ubi enim æquinoctia tria continentia, ac propterea intervalla duo notata ſunt, ſi intervallorum ſumma ab anni tropici quantitate utcumque nota dierum præterpropter 365 horarum 5. 49 pluſculis minutis diſſideat, in aliquo eorum æquinoctiorum vitium prodit, in eo præſertim cujus a proximo intervallum magis ab ea temporis menſura diſſidet, quam menſuram frequentius in ſerie recurrere apparet, id quod etiam fallaciam indicare poteſt ubi duo tantum æquinoctia ſibi ſuccedant, & unicum intervallum occurrat. Intervallum enim tam ab autumnali æquinoctio ad vernum dierum 178 & horarum amplius 17, quam a verno ad autumnale dierum 186, horarum fere 12 toto horum octoginta annorum decurſu ſatis ſibi conſtare debet, niſi quod illud ex anno 1656 ad 1732 tertiam circiter vel quartam horæ partem adauctum, hoc vero tantumdem contractum aſtronomicæ rationes poſtulant. Sed & in iis æquinoctiis quæ in hac ſerie ſolitaria ſunt errores deprehendere licet ſi cum aliis cognominibus æquinoctiis uno aut pluribus quadrienniis inde diſſitis conferantur, quod æquinoctia in anno Juliano quadriennio quolibet minutis 43 aut 44 antevertere ſatis ſit exploratum. Mihi quidem quæ primis annis a gnomonis conſtructione obſervata fuerant non tam exquiſite ſibi reſpondere videntur, quam quæ ſtatim a reſtauratione definita ſunt, neſcio an ex illa polorum inconſtantia quæ major illo tempore quam hoc eſt inventa; neque tamen melius inter ſe ſe conſentiebant ubi altitudinem poli perpetuo eandem aſſumerem. Præclare tamen definitum videtur autumnale æquinoctium anni 1672 die 21 Septembris hora 20. 29, quod Richerio obſervante in Cayenna commiſſum eſt hora 16. 10, nempe Bononiæ hora 20. 31. Sed & intervallum inter utrumque ejus anni æquinoctium ex Bononienſibus obſervationibus, dierum ſcilicet 186. 12. 18 in Richerianas obſervationes fere quadrat, e quibus intervallum illud eſſe oportuit dierum 186. 12. 21.

Poſtremis vero hiſce annis quibus correctionem illam a depravato libramento obſervationibus adhibui, æquinoctiorum intervalla recte, atque ordine procedunt, quantum ſcilicet obſervandi difficultates permittunt, non enim in hoc obſervationum genere perpetuo expectandum ut tempora infra decimam, aut duodecimam horæ partem certiſſime determinentur.

Jam ergo ut experiamur quam ſubtiliter ab hiſce æquinoctiis anni quantitas conſtitui poſſit, duo ſeligemus eadem tempeſtate obſervata, ac maximo quam fieri poſſit periodorum quadriennalium numero inter ſe diſtantia, nempe autumnalia duo annorum 1656 & 1732, hæc enim & annis 76 (quæ Callipica eſt periodus) nempe quadrienniis 19 diſtant, & in primis ſatis accurate definita videntur, ſive eorum a proximis intervalla ſpectemus, ſive ipſa cum aliis cognominibus conferamus. Commiſſum eſt igitur autumnale æquinoctium anni 1656 die 21 Septembris Gregoriani, ſive die 11 Juliani hora 23. 13, anni autem 1732 die 22 Septembris Gregoriani, hoc eſt Juliani rurſum die 11 hora 9. 13; annis itaque 76 Julianis æquinoctii anteceſſio fuit horarum ipſarum 14, quæ in annos 76 tributæ ſingulos annos tropicos a Julianis deficere oſtendunt

 min.

min. 11. ſec. 3, atque hæc ſcrupula ex anno Juliano dierum 365 hor. 6 ſubducta anni tropici longitudinem produnt dierum 365 hor. 5. 48. 57. Sed ſi pro veris æquinoctiis mediorum rationem habeamus, præceſſio illa horarum 14 contrahenda erit minutis præterpropter 9, quibus in annos ſingulos competunt ſecunda 7, ac tantumdem augendus annus modo inventus, ut fiat dierum 365 hor. 5. 49. 4.

Hic autem anni vertentis modus ſecundis haud amplius 8 ab eo diſcrepat quem Caſſinus in commentariis regiæ Pariſienſis academiæ anni 1703 elicuit, dierum 365 hor. 5. 49. 12, collato ſcilicet ejus anni æquinoctio, quod ipſe Pariſiis notavit die 20 Martii hora 20, cum eo quod Hipparcus ante annos 1848 Alexandriæ definiverat. Idem anni 1703 æquinoctium hoc gnomone determinavimus (uti in ſerie notatum eſt) hora 20. 32, quod Pariſienſi obſervationi, ſi meridianorum differentia attendatur, ad unguem fere conſentit, annique menſuram ex Hipparchæo æquinoctio deductam ad ſenſum eandem reſtituit. Apparet ergo, etſi nondum ulla ex hiſce Bononienſibus obſervationibus annorum 80 ætatem excedit, haud multum abeſſe quominus paria cum illis faciat quas a veteribus accepimus; neque dubitandum fore ut qui uno vel altero ad ſummum ab hinc ſæculo eidem indagini vacaverint, ad rem hanc ſubtiliſſime explicandam antiquorum æquinoctia non valde requirant.

Caput XIX.

De ſolſtitiis obſervandis atque anni tropici modo iterum exinde perveſtigando.

Anni vertentis menſuram non æquinoctiorum modo, ſed & ſolſtitiorum ope inveſtigari poſſe in ſpem nos adduxit recentiorum aſtronomorum ſolertia, poſtquam ſolſtitiorum ipſorum articulis ſat accurate comprehendendis rationes excogitatæ ſunt, quam rem minime in poteſtate eſſe veteres opinabantur. Ex omnibus autem methodis quæ ad ſolſtitia invenienda circumferuntur illa ſubtilitate præſtare videtur quam Hiræus indicaverat, ejuſque exempla in commentariis Pariſienſis academiæ annorum 1714 & 1715 a viro nobiliſſimo Malezievio allata extant; ſi nempe tempora duo obſervando inveſtigentur, alterum ante ſolſtitium, a ſolſtitio alterum, quibus temporibus centrum Solis in eodem circulo æquatori parallelo verſetur. Ubi enim hæc nota fuerint ad utrumque illud tempus æquatio Solis e tabulis aſtronomicis ſelectioribus ſupputanda erit, indeque tempora alia duo eruenda, quibus linea medii motus Solis eaſdem illas poſitiones duas aſſecuta fuerit, quas linea motus veri in utraque obſervatione obtinuerat; ita fiet ut momentum quod horum temporum intervallum bifariam dividit in ipſum ſolſtitium medium incidat; quare cum ex iiſdem tabulis medii verique ſolſtitii intervallum ex æquatione ſolſtitiali notum eſſe poſſit, veri quoque ſolſtitii momentum patefiet. Sed hoc ipſum Maraldi epilogiſmo expeditius obtinebitur, ſi utriuſque æquationis

tionis, quæ obſervationum duarum temporibus competit ſemidifferentia ab æquatione ſolſtitiali ſubducatur, ac tempus reſiduo reſpondens quum de ſolſtitio æſtivo quæſtio eſt, tempori quod inter obſervationes duas mediat detrahatur, cum de hyberno addatur.

Veluti ſi inveniendum proponatur ſolſtitium hyemale anni 1733, extat eo anno ante ſolſtitii tempus, die videlicet 16 Octobris, meridiana obſervatio a celeberrimo Celſio hoc gnomone habita diſtantiæ Solis a vertice gr. 53. 28. 42, poſt ſolſtitium vero, die ſcilicet 25 Februarii 1734 eodem obſervante diſtantia illa inventa eſt nonnihilo major nempe gr. 53. 33. 28, ſed die 26 jam minor, ſcilicet gr. 53. 10. 59; propterea manifeſtum eſt reditum Solis ad eundem parallelum quem die 16 Octobris meridie occupaverat incidere inter meridiem utrumque dierum 25 & 26 Februarii, ſubductiſque rationibus ex diurna diſtantiæ mutatione, quam fuiſſe apparet min. 22. 29 prodit hora 5. 5 poſt meridiem diei 25, qua hora Sol eandem illam declinationem eſt aſſequutus. Intervallum ergo temporis fuit dierum 132 horarum 5, min. 5, ejuſque intervalli medium incidit in diem 21 Decembris hora 2. 32. Jam e Caſſini tabulis meridie d. 16 Octobris æquatio Solis fuerat gr. 1. 52. 22, die vero 25 Februarii hora 5. 5 fuit gr. 1. 39. 14, quarum æquationum ſemidifferentia min. 6. 34. Veri ſolſtitii tempus exhibent eædem tabulæ die 21 Decembris hor. 6. 13, eoque momento æquationem Solis ſtatuunt min. 16. 1, ex qua deducta ſemidifferentia illa min. 6. 34, reliqua fiunt min. 9. 27, quæ quidem linea medii motus conficit horis 3. 50. Hoc ergo tempus ex die 21 Decembris hora 2. 32 deinceps numeratum verum ſolſtitii momentum oſtendit eodem die hora 6. 22.

Perutile eſt autem atque adeo neceſſarium Solſtitii tempus ex duarum obſervationum conjugatione hoc pacto inventum e ſimilibus aliis conjugationibus perſcrutari quo de eo certius liqueat. Ita in hoc quod indagandum ſumſi decem obſervationum ſibi reſpondentium paria nactus ſum, e quibus ſolſtitii horam elicui ut hic vides.

1733. 16 Octob. meridie, &	1734. 25 Febr. h. 5. 5; inde Solſtitium 21 Dec.	h. 6. 22
21 Octob. meridie	20 Febr. h. 6. 1	h. 6. 20
22 Octob. meridie	19 Febr. h. 6. 13	h. 6. 20
29 Octob. meridie	12 Febr. h. 7. 28	h. 6. 20
10 Nov. meridie	31 Jan. h. 9. 42	h. 6. 27
11 Nov. meridie	30 Jan. h. 9. 29	h. 6. 16
12 Nov. meridie	29 Jan. h. 9. 50	h. 6. 22
14 Nov. meridie	27 Jan. h. 9. 59	h. 6. 13
15 Nov. meridie	26 Jan. h. 10. 4	h. 6. 15
27 Nov. h. 11. 58	14 Jan. meridie	h. 6. 32

ac propterea ſi ex hiſce decem determinationibus media eligatur, tempus Solſtitii accuratius conſtitutum erit die 21 Decembris hora 6. 20.

Ceterum cum inter primas a gnomone conſtructo obſervationes ſolſtitium quærerem quod cum iis quæ recenter obſervata ſunt componerem, ac inde annum tropicum ſupputarem, nullum occurrit aliud cui accurate definiendo ſat obſervationum ſuppeteret quam quod hyeme anni 1656 commiſſum eſt. Ad ejus tempus ſcrutandum tria hæc obſervationum paria reperi.

1656.26 Oct.h.23.13, & 1657.13 Feb.meridie; unde Solſtitium 20 Dec.h.13.40
11 Nov.h.1. 5 29 Jan.meridie h.13.44
27 Nov.h.1.56 13 Jan.meridie h.13.24
quale ſolſtitii tempus ſtatui poſſe videtur die 20 Decembris hor. 13. 36.

Jam ergo ſi hoc ſolſtitium cum eo componatur quod nuper hyeme anni 1733 definivimus, nonnihil operoſior erit calculus, quod quadriennales periodi tempus hiſce ſolſtitiis duobus interjectum non metiantur. Ex anno igitur 1656 die 20 Decembris Gregoriani, ſive 10 Juliani hor. 13. 36, ad annum 1733 die 21 Decembris Gregoriani, nempe iterum Juliani 10 hor. 6. 20, dies numerantur omnino 28123 horæ 16. 44, quæ ſi in minuta horaria reſolvantur fiunt min. 40498080, atque hoc temporis intervallo anni ipſi tropici 77 expleti ſunt. Subductis rationibus anno cuilibet tropico obtingunt dies 365 hor. 5. 49. 5 ſi veros motus ſpectemus. Sed cum anno 1656 æquatio ſolſtitialis hyberna ex tabulis Caſſinianis fuiſſet min. 13. 23, atque idcirco ſolſtitium verum medio ſuccederet horis 5. 26, anno autem 1733 æquatio fuerit min. 16. 1, ac propterea verum ſolſtitium poſt medium contigerit horis 6. 30, contrahendum eſt intervallum hora 1 min. 4, & anni quantitas ſecundis fere 50 minuenda, ut fiat dierum 365 hor. 5. 48. 15.

Animadvertendum eſt autem ad anni tropici medii inveſtigationem æquinoctia ſolſtitiis in eo præſtare quod apſidum motus, ſine quo neque æquationes inveniri neque adeo medii, ac veri anni differentia taxari poteſt, niſi ſubtiliſſime ſit exploratus longe majora in ſolſtitiis quam in æquinoctiis diſcrimina efficiat. Qua porro ratione motus ille ex ipſis hiſce obſervationibus inveſtigari poſſit, explanandum reſtat; ſed antea de ipſorum ſolſtitiorum temporibus nova quadam, ac ni fallor certiori methodo inveniendis, quin etiam de longitudine Solis toto anno accuratius cognoſcenda nonnulla mihi dicenda ſunt.

Caput XX.

Nova methodus longitudini Solis in ſingulos dies definiendæ, ut neque refractionum ratio habenda ſit, neque loci latitudo, neque obliquitas eclipticæ neque ulli ex aſtronomorum hypoteſibus numeri aſſumi debeant.

QUæcumque de uſu harum obſervationum in exquirendis Solis motibus hactenus diximus, atque exemplis illuſtravimus ſatis ni fallor inſtrumenti præſtantiam declarant. Sunt tamen in hac re quidam certitudinis limites quos vel perfectiſſimis inſtrumentis tranſgredi ars ipſa non ſinit, niſi forte obſervationibus altitudinum aut diſtantiarum a vertice aliæ adjungantur. Non enim æque certo ac ſubtiliter (quod ſæpe notavimus) verus Solis locus in ecliptica ex meridianis diſtantiis a vertice dignoſci poteſt atque ipſæ diſtantiæ determinantur, in quibus ſecundorum ut plurimum quinque interdum etiam bi-

norum

norum aut ſingulorum dubietatem facile vitamus, cum in illo de uno ſaltem vel altero ſcrupulo primo ſæpe etiam de tribus aut quatuor, eoque amplius ambigi neceſſe ſit. Nimirum ut longitudinem Solis eruas ex ejus declinatione computum ineas oportet, quæ certa eſſe nequit niſi primum diſtantia a vertice a refractionibus liberetur; refractiones vero ad ipſa ſecunda ſcrupula conſtitutas eſſe, nec minimum interdum mutari nemo facile dixerit; deinde altitudo poli eſt prænoſcenda, quæ ipſa & refractionibus iterum involvitur, & ob ejus inconſtantiam novis ac majoribus difficultatibus rem impedit. Poſtquam declinatio utcumque innotuit ſi obſervatio prope æquinoctia incidat ubi quam minimum in longitudine ſupputanda errari poteſt, tamen erratum ſemiſſis minuti ſeſquiminuto fere longitudinem vitiat; ſin autem longius ab æquinoctiis tum vero & quo magis ab his receditur errores magis exſcreſcunt & altera inſuper exiſtit errandi cauſa ab inordinata necdum ſatis comperta eclipticæ trepidatione profecta, ex quo rurſum tantumdem atque ex declinationis incertitudine falli potes.

Una ſupereſſe videtur ſolſtitiorum determinatio quæ ſi ea methodo ineatur quam ſuperiori capite expoſuimus hiſce difficultatibus non laborat; non enim in ejuſmodi ſupputationibus aut refractiones, aut altitudinem poli, aut eclipticæ inclinationem moramur, quinimo ne inſtrumenti quidem conſtitutio, ſi illud forte minus recte habuerit, quicquam turbat, ut propterea haud immerito recentiores aſtronomi plus uni ejuſcemodi determinationi quam ſexcentis extra ſolſtitia fidendum exiſtiment. Verum, ut omittam non maximo operæ pretio duobus denique toto anno diebus Solis locum definiri, reliquis vero omnibus nihil exquiſite ſtatui, illud non injuria argui poſſe videtur quod ad ſolſtitia eo pacto invenienda æquationes Solis ex aſtronomorum tabulis aſſumi debeant; cum enim tabulæ ipſæ ab obſervationibus vel condendæ vel emendandæ ſint, minus recte neque ordine fieri videtur ſi obſervationes abſque tabulis uſui eſſe nequeant. Ac ſane haud ſemel expertus ſum ubi e duabus iiſdem obſervationibus ejuſdem ſolſtitii tempus exquirerem, haud parum diverſum prodire ſi æquationes e diverſis tabulis depromerem. Veluti cum ſolſtitium æſtivum anni 1734 indagarem ex obſervatione Solis diei 16 Aprilis meridie cui reſpondere inveneram diem 26 Auguſti hora 23. 22, Caſſinianæ æquationes ſolſtitium in diem 21 Junii hora 7. 48, Hireanæ vero in eundem diem hora 7. 37 conjiciebant; ac rurſum ex obſervatione diei 8 Aprilis meridie, & diei 4 Septembris hora 1. 1 Caſſini hypoteſes exhibebant ſolſtitium hora 7. 48, Hiræi vero 7. 32. Ac tametſi exiſtimo minus diſſidii reperiendum fuiſſe ubi dierum Solſtitio propiorum obſervationibus uſus eſſem, tamen perpendendum eſt quo propius ad ſolſtitium acceditur eo difficiliorem fieri temporum duorum ſibi reſpondentium inventionem, quibus nempe temporibus Sol eundem parallelum attingat, quod diurna ejus altitudinis variatio perpetuo minor fiat; ut propterea in hac methodo alterum e duobus vix effugere liceat nimirum ut vel tabulis, vel obſervationibus ipſis plus æquo tribuamus.

Cum hæc mecum ipſe reputarem animadverti difficultates omnes quæ hanc indaginem impediunt declinari poſſe ſi obſervationibus hoc gnomone peractis aliæ adjungantur quibus & Solis & inerrantium ſtellarum exſcurſus per meridia-

dianum horologio oſcillatorio determinentur. Methodum ergo tradam qua & ſolſtitia & ceteræ omnes Solis longitudines accuratiſſime inveniantur, ita quidem ut neque refractiones neque poli elevationem neque eclipticæ obliquitatem (niſi hanc præterpropter) prænoſci, neque vero fixarum ſtellarum poſitiones, neque numerum ullum ex aſtronomorum tabulis aſſumi oporteat, quinimo ut ſtellarum ipſarum aſcenſiones eadem opera inveniantur.

Locum Solis in meridiano quam ſæpiſſime potes cum ante ſolſtitia, tum iis elapſis obſervato permagno ac immoto inſtrumento, cujuſmodi Bononienſi huic par haud facile reperies; indeque temporum binorum conjugationes quotlibet elicito, quibus temporibus centrum Solis unum aliquem eundem circulum æquatori parallelum pertranſierit, quemadmodum ſuperiori capite dictum. Iiſdem diebus tranſitum per meridianum tum centri Solis tum ſtellæ inſignis quæ toto anno perdiu videri poſſit ex horologio oſcillatorio definito, idemque per dies ipſos ſolſtitiales præſtato, ac ſubinde diſtantiam temporariam Solis a ſtella ad ſingulorum dierum meridiem ſupputato, eamque diſtantiam, horologio ad eandem ſtellam dietim expenſo, in tempus medium redigito. Eſto jam in ſuprema ſphæra æquinoctialis circulus ACL (*Figura 6*) ejus poli P, R, eclipticæ ſemicirculus uterlibet ASL, ac in eo ſolſtitiale punctum S per quod tranſeat colurus ſolſtitiorum PSR, circulus vero æquatori parallelus in quo obſervationum duarum reſpondentium tempora definita ſunt DGE, eclipticam ſecans in D ubi prima obſervatio habita fuerit, atque in E ubi altera, colurum vero ſolſtitiorum in G. Denique eſto punctum F locus ſtellæ, cujus exſcurſus per meridianum dietim obſervatur, ac per F tranſeat circulus declinationis ſtellæ PFR, parallelum EGD ſecans in H. Manifeſtum eſt igitur, etſi momentum ſolſtitii ob inæqualem Solis motum in ipſum medium temporis inter obſervationes duas in D & E interjecti non incidit, attamen arcum paralleli DE a coluro ſolſtitiorum PCR bifariam dividi in G, ac propterea aſcenſionem rectam ſolſtitialem inter aſcenſiones duas rectas quas Sol in D, atque in E habuit eſſe exquiſite mediam. Quoniam ergo dantur ad ſingulos dies ex obſervationibus temporariæ diſtantiæ centri Solis ac ſtellæ, dabitur ad tempus ipſum obſervationis ante ſolſtitium peractæ in D arcus paralleli DH diſtantiæ illi reſpondens, pariterque arcus HE competens tempori regreſſus Solis poſt ſolſtitium ad parallelum eundem in E; quare & arcus totus DE, & ejus dimidium DG dabitur, quod cum arcu DH, vel HE collatum indicabit arcum HG diſtantiam ſcilicet temporariam quæ ipſo ſolſtitii momento inter Solem S, & ſtellam F interceſſit, quam ſolſtitialem diſtantiam appellabimus. Eapropter cum per ipſos ſolſtitii dies temporaria diſtantia Solis ac ſtellæ meridie ab obſervationibus definita fuerit, dabitur exinde tempus quo hæc diſtantia invento nuper arcui HG æqualis fuit, nempe tempus ipſum quo Sol colurum ſolſtitiorum pertranſiit, ac ſolſtitium in puncto S effecit.

Inventa diſtantia ſolſtitiali Solis ac ſtellæ HG, facile apparet ſi arcus circuli tempori ejus diſtantiæ competens in æſtivo ſolſtitio gradibus 90, in hyberno autem gradibus 270, pro diverſo ſtellæ ad Solem poſitu addatur vel ſubducatur rectam ſtellæ aſcenſionem ad tempus ipſum ſolſtitii exinde conflari. Hac vero comperta perſpicuum eſt ceteris omnibus anni diebus, quibus Solis ſtel-

læque

læque tranſitus obſervati fuerint, rectam aſcenſionem Solis nullo negotio erui, quæ ubi graduum 180 vel 360 inveniatur æquinoctiorum tempora oſtendet, ubi vero Sol extra æquinoctia verſetur, tamen ex aſcenſione recta longitudo erui poterit, modo eclipticæ obliquitas præterpropter nota ſit; non enim ad hoc neceſſe eſt eam exſquiſite definire, quando vel ſolidi minuti diſcrimen ſecundis ut maxime duodecim, haud amplius, longitudines vitiare poteſt.

Methodi hujuſce, in quam non ante ſuperiorem annum 1734 incidi, ſtatim in utroque ſolſtitio ejus anni perſcrutando periculum feci, obſervationes peragentibus ad Divi Petronii partim ornatiſſimo viro Andreæ Celſio, quoad is Bononiæ eſt diverſatus, partim Roverſio; tranſitus vero Solis per meridianam lineam in hoc publico obſervatorio extento filo deſignatam captantibus ut plurimum Marcheſio, necnon Euſtachio Zanotto, interdum me ipſo quum per valetudinem licuit. Elegimus autem ad hanc indaginem ſtellam Sirii, quæ multis de cauſis omnium aptiſſima eſt viſa, iidemque ejus ſtellæ tranſitus obſervarunt per planum muralis ſemicirculi, quod plurimis experimentis compertum habemus in parallelo ſtellæ ſecundis temporariis $13\frac{1}{2}$ a meridiana illa linea in occaſum aberrare, unde ſingulos ſtellæ excurſus ad ipſum meridianum reduximus. En autem in ſynopſi primum ad æſtivi ſolſtitii indaginem conjugationes undecim temporum ſibi reſpondentium recurſus Solis ad eoſdem parallelos, necnon ejus diſtantias temporarias a Sirio tam ante ſolſtitium quam poſt, temporibus mediis expreſſas, ac denique diſtantias ipſas temporarias ſolſtitiales quas e conjugationibus ſingulis ſupputavi.

Conjugationes	1734 *Tempora ante ſolſtitium.*	1734 *Tempora reſpondentia poſt ſolſtitium*	*temp. app. poſt mer.* H I	*Ante ſolſtitium* *Sirius ſequitur Solem temp. med.* H I II	*Poſt ſolſtitium* *Sirius præcedit Solem temp. med.* H I II	*Diſtantiæ temporariæ ſolſtitiales a Sole ad Sirium temp. med.* H I II
1	31 Martii meridie	12 Septembris	3. 4	5. 53. 52	4. 47. 8	0. 33. 22
2	5 Aprilis meridie	7 Septembris	2. 14	5. 35. 44	4. 29. $3\frac{1}{2}$	0. 33. $20\frac{1}{4}$
3	6 Aprilis meridie	6 Septembris	1. 42	5. 32. $5\frac{1}{2}$	4. 23. 28	0. 33. $21\frac{1}{4}$
4	8 Aprilis meridie	4 Septembris	1. 1	5. 24. $49\frac{1}{2}$	4. 18. 6	0. 33. $21\frac{1}{4}$
5	9 Aprilis meridie	3 Septembris	0. 48	5. 21. 11	4. 14. 25	0. 33. 23
6	11 Aprilis meridie	1 Septembris	0. 21	5. 13. $53\frac{1}{2}$	4. 7. 7	0. 33. $23\frac{1}{4}$
7	12 Aprilis meridie	31 Auguſti	0. 9	5. 10. 14	4. 3. 27	0. 33. $23\frac{1}{2}$
8	15 Aprilis meridie	27 Auguſti	23. 28	4. 59. 13	3. 52. 26	0. 33. $23\frac{1}{4}$
9	16 Aprilis meridie	26 Auguſti	23. 22	4. 55. 31	3. 48. 46	0. 33. $22\frac{1}{2}$
10	4 Junii meridie	8 Julii	16. 19	1. 44. $56\frac{1}{2}$	0. 38. 14	0. 33. $21\frac{1}{4}$
11	5 Junii meridie	7 Julii	15. 56	1. 40. 50	0. 34. 4	0. 33. 23

Ex hiſce determinationibus ſolſtitialem diſtantiam eligendam apparet hor. 0. 33

o. 33. 22 quippe inter omnes mediam. Porro tranſitus Solis ac Sirii per meridianum, qui diebus ſolſtitio proximis obſervati ſunt diſtantiam hanc a Sole ad Sirium conveniſſe oſtendunt in diem 21 Junii hora 7. 52 tempore apparenti, quæ propterea eſt ipſa ſolſtitii hora, vix quicquam ab ea diſcrepans quam Maraldi methodo elicui e conjugationibus 1, 4, 7, 9, 10, 11, nempe 21 Junii hora 7. 49.

Huic autem ſolſtitiali diſtantiæ reſpondent circuli partes 8. 21. 52, quæ adjectæ gradibus 90 aſcenſionem rectam Sirii conſtituunt ad exitum Junii 1734 graduum 98. 21. 52.

Ad indagandum vero ſolſtitium hybernum ejuſdem anni 1734 quinque haud amplius nacti ſumus obſervationum paria quæ ſequuntur.

Conjugationes	1734 *Tempora ante Solſtitium.*	1735 *Tempora reſpondentia poſt Solſtitium. temp. app. poſt mer.*	*Ante Solſtitium Sirius præcedit Solem temp. med.*	*Poſt Solſtitium Sirius præcedit Solem temp. med.*	*Diſtantia temporaria ſolſtitiales a Sirio ad Solem temp. med*
		H l	H l ll	H l ll	H l ll
1	12 Novembris meridie	29 Januarii 21. 27	8. 34. 50 $\frac{1}{2}$	14. 14. 25	11. 24. 37 $\frac{3}{4}$
2	13 Novembris meridie	28 Januarii 21. 37	8. 38. 53 $\frac{1}{2}$	14. 10. 20	11. 24. 36 $\frac{1}{2}$
3	14 Novembris meridie	21 Januarii 21. 54	8. 42. 58	14. 6. 17	11. 24. 37 $\frac{1}{2}$
4	28 Novembris meridie	13 Januarii 23. 48	9. 41. 40	13. 7. 34 $\frac{1}{2}$	11. 24. 37 $\frac{1}{4}$
5	29 Novembris meridie	13 Januarii 0. 7	9. 45. 59	13. 3. 22 $\frac{1}{2}$	11. 24. 40 $\frac{3}{4}$

Non adeo certo liquere potuit de hujuſce ſolſtitii tempore atque de eo quod æſtate commiſſum erat, quod diebus ipſis ſolſtitialibus vel Solis vel Sirii conſpectum in meridiano nubes prohibuerint. Attamen electa ſolſtitiali diſtantia omnium media hor. 11. 34. 38 ex obſervationibus dierum 17 & 25 Decembris collegimus Solem eam diſtantiam attigiſſe die 21 hora 12. 11. Maraldi autem methodo ſolſtitium prodit hora 12. 21.

Porro diſtantiæ temporariæ ſolſtitiali hor. 11. 24. 38 competunt gr. 171. 37 37 qui e gr. 270 ſubducti dant aſcenſionem rectam Sirii ſub exitum Decembris anni 1734 gr. 98. 22. 23.

Notandum autem motum illum quo ſtellæ ſingulæ ſenſim progrediuntur, ſive æquinoctialium punctorum præceſſionem, ſolſtitiorum determinationi hac methodo peractæ nihil officere, ac propterea nullam ejus rationem a me in hiſce calculis habitam; perinde eſt enim ſive aſcenſio recta ſtellæ eadem maneat ſive æquabile augmentum perpetuo ſuſcipiat, nam cum temporariæ differentiæ Solis ac ſtellæ in punctis D & E inter ſe ſe comparantur dimidium ejus incrementi in ſolſtitiali diſtantia includitur neque inde ſolſtitii tempus quicquam mutatur, aſcenſio vero ſtellæ quæ inde elicitur ad neutrum tempus D

vel

vel E, ſed ad ipſum ſolſtitii momentum attinet. Diebus vero aliis a ſolſtitio remotioribus plane habenda eſt ratio motus fixarum quo ex aſcenſione ſtellæ Solis aſcenſionem arguere liceat, cujus motus quantitas annua (niſi eam veluti certo ab aſtronomis conſtitutam aſſumere lubeat) ex duorum cognominum ſolſtitiorum aliquot annis diſtantium obſervatione taxari poteſt.

Non ignoro quid ſcrupuli ſuboriri poſſit in hujuſce methodi uſu. Cum enim rectæ ſtellarum aſcenſiones minime pro temporum intervallis æquabiliter augeri deprehenſæ ſint, (qua de re nonnullæ etiam noſtræ obſervationes extant) dubitandum videtur num ea ex cauſa ſolſtitiorum determinatio turbari poſſit. Verum nihil aut exiguum quiddam incommodi metuendum inde crediderim. Stellarum enim evagationes ſecundum aſcenſionem non aliter perſpectæ ſunt quam ex duarum earumdem temporaria differentia, quæ aliis anni diebus alia eſt inventa, paucorum ſane ſecundorum diſcrimine; cujus diſcriminis ſi eam quam æquum eſt partem ſtellarum inter ſe ſe acceſſui aut receſſui (qui ſecundum aſcenſiones aliquis eſſe debet) tribuamus, reſidui vero ſemiſſem aut præterpropter ſingulis illis ſtellis duabus adſcribamus, vix eſt ut ſingularum inæqualitas tota paucula temporis ſecunda excedat, quæ tamen ne tota quidem in hac re attendi debet, obſervationes enim non ſemeſtri ſpatio, ſed minori inter ſe diſſitas ad hanc indaginem ſeligere poſſumus.

Optandum equidem eſt ut de harum aberrationum legibus aſtronomi aliquid conſtituant, cui rei virum egregium Jo: Jacobum Marinonium Cæſareum mathematicum ſedulam navare operam ab ipſo accepi. Mihi, quantum experiri hactenus licuit in ſtellis inter ſe ſe oppoſitis, Sirio præſertim ac Lyra, aut capella & Lyra maximarum evagationum aſcenſionalium termini in ea tempora incidere videntur quibus earum ſtellarum altera meridie, altera media nocte ad meridianum allabitur, ita quidem ut tempus ab ea quæ Soli jungitur ad eam quæ opponitur numeratum tunc ſit maximum, id quod oſtendere videtur ſtellas ſingulas prope conjunctionem aſcenſionalem in occaſum, prope oppoſitionem in ortum aberrare, neque ab hac regula, quam ante annos aliquot ſuboſfeceram, abhorrent obſervationes cum multæ a Marinonio, tum aliquæ a nobis ſuperiore anno peractæ. Quod ſi ita eſt, erroris periculum (ad ſolſtitia quod attinet) evitari, aut certe minui poteſt ubi ſtellam ſeligamus non longe a coluro ſolſtitiorum locatam, id quod præſertim de Sirio ac Lyra percommode accidit, duorum enim aut trium menſium ſpatio ſtellæ aſcenſionem vix quicquam mutari oportet. Alias vero longitudines Solis, cum longius a ſolſtitiis diſtat, etſi errori alicui hac de cauſa obnoxias eſſe non negaverim, tamen longe minus incertas arbitror quam ſi per declinationes inveſtigentur. Sed & minus ab hiſce fallaciis timendum erit ſi pro anni temporum diverſitate ſtellæ aliæ ad hanc indaginem eligantur, quarum aſcenſiones ex prioris ſtellæ aſcenſione eliciantur, quo tempore de illius aberratione nondum ſuſpicio pervaſerit.

Duorum autem aut plurium ſolſtitiorum ſibi continenter ſuccedentium determinationes hac methodo peractæ evagationibus ipſis ſtellarum taxandis non inutiles eſſe poſſunt. Si enim ab æſtivo ſolſtitio ad brumale, vel ab hoc ad illud ſtellæ aſcenſionem rectam plus minuſve adauctam appareat quam ſemeſtris punctorum æquinoctialium præceſſio requirat, quicquid prodit diſcriminis

ſtellæ evagatio eſt. Veluti in ſolſtitiis duobus anni 1734 cum aſcenſio Sirii æſtivo inventa ſit gr. 98. 21. 52, hiberno 98. 22. 23, apparet augmentum ejus ſemeſtri ſpatio fuiſſe ſec. 31 cum tamen eo tempore proprius fixarum motus ſecundum aſcenſiones ſecunda 20 haud amplius ſibi vindicet, reliqua ſunt igitur ſecunda 11 quibus ſtella a Junii ad Decembris exitum ortum verſus eſt evagata; neque ſane erroris hujuſce plaga ab ea lege abhorret, quam ſupra ſtatui, ſed ad ejus quantitatem certius comprehendendam multorum ſolſtitiorum experimenta colligenda videntur.

Caput XXI.

De motu apogæi Solis e ſolſtitiorum obſervationibus eruendo.

NUnc ad motum abſidum Solaris orbitæ revertor, quem motum ex hac ipſa meridiana linea obſervationibus inveſtigari poſſe dixeram. Nec ſane dubium eſt quin id poſſit methodo pervulgata. Si enim apogæi locus anno quopiam ab obſervationibus inveniatur (cujus inveniendi ratio multiplex ab aſtronomis traditur, ac nos etiam nonnulla ea de re mox afferemus) ac rurſum anno alio ſatis inde diſſito idem præſtetur, locorum duorum comparatio apogæi progreſſum annorum intervallo reſpondentem patefaciet. Verum cum perdifficile habeatur in apogæi loco plurium minutorum errorem vitare, vix eſt ut hoc pacto ejus motus ſubtiliter conſtitui queat, niſi tempora pluribus ſæculis diſtantia inter ſe ſe conferantur; quæ ne a poſteris expectanda ſint, aliam quandam rei conficiendæ rationem proponam.

Definiatur quam accurate fieri poteſt uno aliquo anno utriuſque ſolſtitii tempus, ea præſertim ratione quam ſuperiori capite tradidi, in qua nihil prorſus ex aſtronomicis tabulis tanquam notum aſſumitur, idemque fiat poſt annos circiter 100 inde evolutos. Jam ſi ſolſtitialia ſingulorum annorum intervalla invicem comparentur ſatis ſubtiliter explorari poterit quæ inter annos illos duos abſidum progreſſio fuerit. Eſto enim in adjecto ſchemate diameter eclipticæ, quæ ad puncta ſolſtitialia dirigitur, AB (*Figura* 7) cujus extremum A ad initium Cancri, B ad Capricorni pertineat, ſignorumque ordo ex B per K ad A procedat. Eclipticæ ac telluris centum eſto C, per quod acta ſit abſidum Solaris orbitæ linea EO, cujus extremum O apogæum eſt, extremum E perigæum. Cum ergo ævo noſtro illud circiter octavum gradum Cancri, hoc vero circiter octavum Capricorni verſetur, propptereaque punctum æſtivi ſolſtitii A ad poſtremum anomaliæ quadrantem ſpectet, ubi æquationes medio motui adjiciuntur ut verus conſletur, manifeſtum eſt: quoties linea motus veri ad poſitum ſolſtitialem CA revertitur lineam motus medii ſecundum longitudinem minus promotam fore quam CA, contra atque hiberno ſolſtitio, quippe quod in quadrantem anomaliæ ſecundum incidit, ubi æquationes a medio motu ſubducuntur. Momento igitur ſolſtitii æſtivi priore anno obſervati eſto linea motus medii in CH, momento autem hiberni ejuſdem anni in CD. Deinde

de elapſo eo annorum intervallo ex quo ſolſtitiorum obſervationes repetitæ ſunt, cum linea apſidum EO ad aliquid ſpatii ſecundum ſignorum ſeriem progreſſa fuerit, neceſſe eſt majores fieri angulos OCA, ECB quos angulos linea mobilis OE cum immota ſolſtitiorum diametro BA continet; quapropter utraque æquatio ſolſtitialis major evadet, ac linea medii motus in ſolſtitio æſtivo adhuc minus promota erit, veluti in CG, in hiberno autem magis promota ut in FC. Angulus igitur DCH qui priore anno intervallum temporis a ſolſtitio hyemali B ad æſtivum A metiebatur, contractus erit in FCG, ac propterea tanto minus temporis inter ea ſolſtitia intercedet quantum ſumma angulorum DCF, GCH poſtulat, tanto vero plus ab æſtivo ad hibernum numerabitur.

Aſſumpta igitur certa aliqua menſura annua motus apogæi, ſupputa ejus motus quantitatem quæ annorum intervallo competit, ac ſubinde quære in tabulis aſtronomicis circiter eos gradus anomaliæ, qui gradus ſolſtitialibus punctis A, & B reſpondent, quanto utraque æquatio Solaris BCD, ACH augeatur, ubi anomalia ea quantitate motus augetur; ita enim angulos DCF, HCG conflabis, ac ſubinde tempus eorum angulorum ſummæ, pro horario motu Solis medio, congruens ſupputabis. Tum vero ut hoc tempus ad decrementum intervalli quod a ſolſtitio hiberno ad æſtivum priore, ac poſteriore anno interceſſit, (vel ad incrementum ab æſtivo ad hibernum) ita erit aſſumpta motus annui apogæi quantitas ad verum ejus motus quantitatem. Etſi vero neque ſolſtitiorum binorum ac binorum obſervationes adeo diſſitæ extant in hac ſerie quam tradimus, nec præter duo anni 1734 alia ſunt ulla quæ per ſtellarum obſervationes ſcrutatus fuerim, duo tamen omnium quæ utraque eodem anno extent antiquiſſima, Maraldi methodo ſupputata, cum poſtremis hiſce duobus conferam, ut methodum exemplo aliquo explanem.

Solſtitium igitur æſtivum anni *1695* conjugationibus quinque obſervationum reditus Solis ad eoſdem circulos parallelos definivi die 20 Junii hora 21 38, hibernum vero conjugationibus ſimilibus ſex determinavi die 21 Decembris hor. 0. 52. Fuit ergo intervallum ab æſtivo ad hibernum dierum 183 hor. 3. 14. Anno autem 1734 ante invenimus conjugationibus undecim ejuſcemodi obſervationum, adjunctis temporariis diſtantiis Solis a Sirio, incidiſſe ſolſtitium æſtivum in diem 21 Junii hora 7. 52, hibernum vero conjugationibus quinque una cum temporariis totidem diſtantiis, in diem 21 Decembris hora 12. 11; ac propterea intervallum ab æſtivo ad hibernum prodit dierum 183 hor. 4. 19. Ejus ergo intervalli augmentum ab anno *1695* ad 1734 fuiſſe apparet horæ unius, minutorum quinque, idque ſpatio annorum *39*. Jam ſi motus annuus apogæi ſumatur ſecundorum *60*, annis *39* competent utique minuta *39*. Porro in tabula Caſſiniana æquationum Solis ubi anomalia fuerit ſignorum 11 grad. 22, quæ eſt præterpropter æſtivo ſolſtitio, mutatio anomaliæ minutorum *39* æquationem mutat minutis 1. 18; ubi vero anomalia ſit ſignorum 5. 22 (quæ hiberno) augmento anomaliæ minutorum *39* reſpondet æquationis incrementum minutorum 1. 20. Augmenti igitur utriuſque, nempe angulorum HCG, DCF ſumma eſt minutorum 2. 38, quæ Sol medio motu emetitur hora 1. min. 4, ac tantumdem auctum fuiſſe oportuit ſolſtitiale interval-

lum ab æſtate ad brumam ex anno 1695 ad annum 1734, ſi annuus apogæi motus ſit ſecundorum 60, quantum eum poſuimus. Cum ergo ex intervallis obſervatis augmentum fuerit hor. 1.5 erit ut hor. 1.4 ad hor. 1.5 ita aſſumptus ille motus ſec. 60 ad verum apogæi motum annuum, ſecundorum ſcilicet plus minus 61; nec valde diverſus motus in hoc exemplo elicitur ſi ex Hiræanis aut Neutonianis tabulis æqnationes petantur.

Spatium porro annorum plus minus centum ſatis eſſe videtur quo motus apogæi annuus intra duorum præterpropter ſecundorum fines cetto comprehendatur, ſi modo ſolſtitia quatuor eligantur, quorum binorum intervalla ſingula minus ſcrupulis quatuor horariis, & intervallorum differentia minus octo a vero abſcedat; errori enim minutorum octo annis centum errorem ſecundorum plus minus duorum in apogæi motu annuo reſpondere comperi.

Porro ſolſtitia tam exquiſite ab hiſce obſervationibus definiri poſſe, ut proximorum duorum intervalla minutis octo non fallant, experimento eorum ipſorum quæ memoravimus liquere poteſt, ſi ea cum proximis aliis quæ itidem ſupputavi conferantur.

			hor. min.
Fuit enim ſolſtitium æſtivum anni 1695	Junii	20	21. 38
Hibernum vero ejuſdem anni	Decembris	21	0. 52
Intervallum eſt	d.	183	3. 14
iterum hibernum anni 1695	Decembr.	21	0. 52
æſtivum vero 1696 elicitur ex obſervationibus ſeriei quam tradimus	Junii	20	3. 30
intervallum	d.	182	2. 38
quod priori intervallo adjectum	d.	183	3. 14
conſtituit	d.	365	5. 52
Eſt vero anni tropici medii quantitas ſatis explorata	d.	365	5. 49
quam menſuram ſumma intervallorum excedit			3
debuit autem ab ea deficere ob apogæi motum annuum, circiter			1
igitur intervallorum ſumma a vero abſcedit minutis haud amplius			4
Similiter hibernum ſolſtitium anni 1733 inventum eſt	Dec.	21	6. 20
æſtivum vero 1734	Junii	21	7. 52
Intervallum igitur fuit	d.	182	1. 32
iterum æſtivum 1734	Junii	21	7. 52
hibernum 1734	Decemb.	21	12. 11
intervallum	d.	183	4. 19
hoc vero priori intervallo additum	d.	182	1. 32

con-

			hor.	min.
conficit ſummam	d.	365	5.	51
annus tropicus medius	d.	365	5.	49
quem inventa intervallorum ſumma excedit				2
cum tamen eam excedere debuerit, ob apogæi motum, tantumodo				1
error igitur ſummæ intervallorum haud amplius				1
Denique intervallum ab æſtivo ad hibernum 1695	d.	183	3.	14
collatum cum intervallo ab æſtivo ad hibernum 1734	d.	183	4.	19
incrementum exhibet			1.	5
intervallum vero ab hiberno 1695 ad æſtivum 1696	d.	182	2.	38
collatum cum intervallo ab hiberno 1733 ad æſtivum 1734	d.	182	1.	32
decrementum oſtendit			1.	6
quod priori incremento conſentit intra				1

id quod intervalla ſingula recte habere evincit, eſto ſolſtitiorum ipſorum abſoluta tempora non comprobet, cum fieri poſſit ut terna priora, quibus computandis æquationes e tabulis aſtronomicis peti oportuit, paribus diſſidiis a vero aberrent. Si vero ſingula ea ratione determinentur, quam ſuperiori capite expoſui, nil opus erit quicquam e tabulis aſtronomorum aſſumi.

CAPUT XXII.

De loco ipſo apogæi Solis inveſtigando.

MUlta quidem ad apogæi Solaris locum in ecliptica determinandum artificia ab aſtronomis excogitata accepimus, quorum præcipua retulit, ac exemplis illuſtravit Jacobus Caſſinus, egregia diſſertatione de hoc argumento edita in commentariis regiæ academiæ Pariſienſis anni 1723. Inter ea illud præſtare videtur quod ipſe adinvenit, ac in eo poſitum eſt ut arcus duo eclipticæ æquales ab obſervationibus definiantur, quos arcus Sol pari temporis intervallo peragraverit; lineam etenim apſidum inter eorum arcuum terminos medio loco ſitam eſſe oportet, quacumque demum lege Solarem motum exerceri, ejuſque inæqualitates diſtribui ponamus. Ad eos autem arcus duos inveniendos quatuor longitudinum obſervationes requiruntur accuratiſſime peractæ; eaque de cauſa ſtellarum potius ac Solis exſcurſus per meridianum, quam Solis declinationes in rem hanc aſſumi jubet.

Non inutile tamen futurum arbitror ſi methodum aliam ſubjecero qua res confici queat duabus tantum obſervationibus per illos dies habitis quibus Solem prope apogæum, ac perigæum hærere conſtat, quæ loca cum propter ſol-

ſtitio-

ſtitiorum viciniam aſtronomis intentata eſſent, quippe qui longitudinem per declinationes exquirere conſueverant, contra maxime opportuna ſunt ubi illa per aſcenſiones rectas ope ſtellarum inveſtigetur, ſtellarumque ipſarum aſcenſiones ab obſervationibus ſolſtitiorum conſtituantur.

Stellæ cujuſpiam inerrantis, veluti Sirii, diſtantiam temporariam a Sole momento æſtivi ſolſtitii definito, ac exinde aſcenſionem rectam ſtellæ ſupputato ea ratione quam capite 20 explicuimus. Subinde paucos poſt dies, cum Sol apogæo eſt proximus iterum temporariam ejus a ſtella diſtantiam obſervato, rectamque Solis aſcenſionem & ex ea longitudinem ad tempus ejus meridiei conficito. Eadem omnia hiberno ſolſtitio ac juxta perigæum repetito, ſive eadem ſtella, ſive alia rem conficere lubeat, modo ſtellæ aſcenſio recta per illud idem hibernum ſolſtitium determinetur. His peractis perpendendum eſt rectarum omnium linearum quæ per centrum telluris duci poſſunt, quæque extremis earum punctis longitudines duas in ecliptica e diametro oppoſitas deſignent, unam eſſe abſidum lineam quæ Solarem orbitam bifariam ſecet; quo fit nulla præter apogæum, ac perigæum puncta duo in ecliptica oppoſita uſpiam exiſtere quorum punctorum diſtantiam dimidio annuæ converſionis tempore Sol emetiatur; vel potius (ne motum illum utut exiguum negligamus quo abſides in annos ſingulos progrediuntur) dimidio ejus temporis quo ab apogæo digreſſus ad illud revertitur; quod equidem tempus, ſi apogæi motum annuum eſſe conſtet ſecundorum 62 (quantum aſtronomi plerique omnes ponunt, ac nos etiam ſuperiori capite præterpropter invenimus) dierum eſt 365 hor. 6. 14, ejuſque dimidium dierum 182 hor. 15. 7; unde apogæi inquiſitio huc denique redit: ut puncta duo in ecliptica inveniantur e quorum altero ad alterum intervallo dierum 182 hor. 15. 7 Sol perrexerit; puncta vero ipſa minime examuſſim oppoſita ſint, ſed dimidio motus annui apogæi nempe ſecundis 31 ſupra gradus 180 inter ſe diſtent. Id autem qua ratione effici poſſit ex obſervationibus illis duabus juxta abſides habitis, facilius exemplo quam præceptis declarabimus. Sumemus autem in hoc exemplo motum diurnum Solis circa apogæum minutorum 57. 10, prope perigæum autem min. 61. 11 quantum aſtronomorum tabulæ fere exhibent, neque obſervationes noſtræ ad aliquot dies hinc inde ab apſidum linea habitæ ab hiſce numeris valde diſcrepant.

Superiore igitur anno 1734 ſolſtitialem diſtantiam a Sole ad Sirium definivimus minutorum 33. 22 temporis medii, ac propterea aſcenſionem rectam Sirii conſtituimus gr. 98. 21. 52, uti dictum capite 20. Die vero 29 Junii diſtantiam temporariam a Sole ad Sirium meridie invenimus min. 1. 35 temporis medii, nempe grad. 0. 23. 48; idcirco erat aſcenſio recta Solis gr. 97. 58. 4, ejuſque longitudo gr. 7. 18. 57 Cancri; ſed cum propter æquationem temporis meridies verus medium ſubſequeretur minutis 3, fuerit oportet longitudo Solis die 29 Junii meridie medio gr. 7. 18. 50 Cancri.

Rurſum diſtantia ſolſtitialis hiberna a Sirio ad Solem inventa eſt horarum 11 24. 38 temporis medii, atque inde aſcenſio recta Sirii gr. 98. 22. 23. Poſtmodum die 30 Decembris Sirius ſequebatur Solem temporibus mediis hor. 12. 2 16, nempe gradibus 181. 3. 40; unde aſcenſio recta Solis meridie gr. 279. 26

3, &

3, & longitudo gr. 8. 39. 57 Capricorni, ſed cum iterum meridies verus medio ſuccederet minutis 3, fuerit longitudo Solis die 30 Decembris meridie medio gr. 8. 39. 49.

Experiamur jam an certa quæpiam apogæi longitudo, quam pro arbitrio aſſumemus gr. 8. o Cancri, illi quod ſupra diximus dimidiæ revolutionis intervallo reſpondeat. Si ergo die 29 Junii fingamus apogæum in gr. 8. o Cancri, erit perigæum die 30 Decembris in grad. 8. o. 31 Capricorni. Ex obſervatione diei 29 Junii & motu Solis diurno min. 57. 10, ſubductis calculis liquet Solem hora 17. 17 attigiſſe gr. 8. o Cancri; ac rurſum ex obſervatione d. 30 Decembris, diurnoque motu min. 61. 11 conſtat eum adventaſſe ad gr. 8. o. 31 Capricorni die 29 ejus menſis hora 8. 35. Intervallum eſt dierum 182 hor. 15. 18 excedens minutis 11 dimidiam revolutionem quam ſupra invenimus dierum 182 hor. 15. 7. Conſtat igitur Solem majori tempore quam dimidia illa revolutionem emenſum fuiſſe eum arcum, qui ex gr. 8. o Cancri ad grad. 8. o. 31 Capricorni numeratur, ac propterea apogæum in hunc ipſum arcum incidere, & die 29 Junii promotius fuiſſe quam in gr. 8. o Cancri.

Periculum ergo faciamus quid contingat ſi apogæum promoverimus minutis 10, ut die 29 Junii ſit in gr. 8. 10. Cancri, ac propterea perigæum die 29 Decembris in grad. 8. 10. 31 Capricorni. Supputatis iterum temporibus quibus Sol utramque hanc longitudinem eſt aſſecutus, prodeunt 29 Junii hor. 21. 29 & 29 Decembris hor. 12. 30. Intervallum eſt dierum 182 hor. 15. 1, deficiens jam a dimidia revolutione min. 6. Apogæum igitur ad finem Junii minus promotum erat quam in gr. 8. 10. Cancri, ac intra duos hoſce limites gr. 8. o, & gr. 8. 10 ejus ſigni conſiſtebat.

Nunc ergo cum apogæo promoto min. 10 differentia intervalli a dimidia revolutione, quæ differentia fuerat min. 11 exceſſus, redacta fuerit ad min. 6 defectus, apparet hanc differentiam mutatam minutis 17. Si ergo minuta 17 reſpondent diverſitati apogæi minutorum 10, neceſſe eſt minuta illa 11 quæ ex priori poſitione prodibant exhauriri ſi apogæum promoveatur ab eo poſitu tantum min. 6. 30, ſtatuaturque in gr. 8. 6. 30 Cancri, & quod inde conſequitur, perigæum die 30 Decembris collocetur in gr. 8. 7. 1 Capricorni. Quod ſi ergo in hac hypoteſi calculi iterum ineantur, apparebit Solem eas longitudines aſſecutum fuiſſe die 29 Junii hora 20. 1, ac die 29 Decembris hora 11. 8, intervallo ſcilicet dierum 182 hor. 15. 7, dimidio nempe ejus temporis quo ab apogæo diſcedens ad idem redit; ac propterea apogæi locum recte habere.

Quamquam autem hæc methodus motum annuum apogæi veluti cognitum aſſumat, qui nondum exacte eſt definitus, tamen expertus ſum ſi ille motus paulo alius ponatur nihil fere apogæum variari, quinimo ne multum quidem intereſſe ſi nulla ejus motus habeatur ratio, modo dimidia revolutio tunc fiat dierum 365 hor. 14. 54, nempe æqualis ſemiſſi anni tropici; prodibat enim mihi ex apogæo immoto locus ejus in gr. 8. 7. 30 Cancri, nempe minuto tantum promotior quam inventus ſit poſito motu annuo ſecundorum 62.

Ad hæc ut methodi ſubtilitatem tentarem, diurnum Solis motum in apogæo pro min. 57. 10 ponebam min. 57. 14, in perigæo autem pro min. 61. 11 aſſumebam min. 61. 9, quos ſcilicet motus obſervationes nonnullæ ſuperiore anno a no-

nobis habitæ exhibent, apogæum tamen perparum inde mutabatur, hærebat enim circa gr. 8. 8 Cancri.

Denique longitudinem Solis die 29 Junii meridie obſervatam nempe grad. 7. 18. 50 Cancri meridie æquali minuebam ſecundis 15 ut eſſet gr. 7. 18. 35; longitudinem vero die 30 Decembris, gr. 8. 39. 49 tantundem augebam ut foret gr. 8. 40. 4, & calculis iterum poſitis apogæum nanciſcebar in gr. 7. 59 Cancri, diſcrimine minutorum 6 vel 7 a priori determinatione. Unde inferre licet apogæum hac methodo ſatis certo ad decimam gradus partem conſtitui poſſe ab obſervationibus quibus ſingulis fallacia ſecundis 15 major non ſubſit, nempe quæ ſingulæ circiter ſcrupulum ſecundum temporis a recto non aberrent, cujuſmodi ſubtilitas aſtronomorum facultatem non excedit.

Caput XXIII.

De Solaris orbitæ excentricitate definienda.

Apogæi quidem indago ſi ejuſcemodi aggreſſionibus inſtituatur, abſoluta eſt, neque ulli certæ hypoteſi adſtricta, excentricitatem vero Solaris orbitæ invenire minime in poteſtate eſt niſi orbitæ ipſius figura vel nota ſit, vel tanquam nota ſpectetur. Eam figuram ellipticam ſtatuunt recentiores aſtronomi, cujus ellipſeos alter umbilicus telluris centro congruat; hac autem hypoteſi aſſumpta ſi diſtantiæ tres Solis a tellure datæ fuerint, una cum angulis quas diſtantiæ ipſæ comprehendunt (differentiæ nempe longitudinum Solis, quæ diſtantiis tribus reſpondent) ellipſeos ſpeciem, ac ex eo excentricitatem, quin etiam tranſverſi axis, nempe apſidum poſitionem inveniri poſſe geometris notum eſt. Diſtantias vero illas tres nanciſci haud modicam difficultatem habet; ſi quis enim e diametrorum Solarium obſervationibus eas inveſtigandas ſuſcipiat vix eſt ut tantam ſubtilitatem aſſequi poſſit quanta in hoc negotio requiritur. Præclare quidem Hallejus quibuſdam planetarum obſervationibus (præſertim Martis) ex certo temporis intervallo habitis quotlibet diſtantias telluris a Sole una cum longitudinum differentiis definiri poſſe oſtendit, ſed mihi quo minus hanc methodum experirer obſervationes idoneæ defuerunt.

Communius tamen aſtronomi ad excentricitatem Solis perquirendam non modo orbitæ figuram aſſumunt, ſed & motus legem, qua lege in ejus figuræ perimetro revolvatur. Ac in illis ſane hypoteſibus in quibus centrum quoddam motus æquabilis in apſidum linea ponitur, circa quod centrum linea ad Solem ducta angulos comprehendat temporibus proportionales, haud difficile eſt excentricitatem perſcrutari, ſive eadem opera qua apogæum ex datis tribus obſervationibus inveſtigatur, ſive apogæo ſeorſim invento, ex tempore quod ab eo ad alium quemvis in ecliptica poſitum Sol impendit, inde enim anomalia tam vera quam media colligitur, quarum differentia æquatio eſt; æquatione autem atque anomalia utralibet cognita excentricitas tam in circulo quam in ellipſi facile ex ejuſcemodi hypotheſibus eruitur.

In

In lege autem Kepleri qui centrum æquabilis motus nullum agnoſcit, ſed areas ellipticas temporibus proportionales ponit, excentricitatis inventio operoſior eſt, ac fere inexplicabilis ſi directa methodo tractanda ſit, neque enim datis tribus planetæ locis, eorumque temporibus, neque data anomalia media ac vera quæ illi reſpondet, ellipſeos ſpecies geometrice determinari poteſt. Itaque aſtronomi ad indirectas methodos confugiunt, cujuſmodi methodum hypoteſi huic aptavit Jacobus Caſſinus ea diſſertatione cujus ſuperiori capite memini.

Poſſet tamen in ea hypoteſi excentricitas geometrice erui ubi maxima ac minima Solis celeritas ſubtiliſſime comperta foret; eſt enim (poſita hac motuum lege) diſtantia Solis perigæi ad ejuſdem apogæi diſtantiam in ſubduplicata ratione celeritatis in apogæo ad celeritatem in perigæo. Datis autem diſtantiis apſidum, ſumma eſt axis ellipſeos, ac differentiæ dimidium excentricitas. Celeritates vero illas ſat accurate menſuris comprehendere liceret ſi longitudo Solis ex ſtellæ alicujus comparatione diligenter inveſtigaretur ſex vel octo diebus antequam ad lineam apſidum perveniret ac totidem poſtquam eam prætergreſſus eſſet, quandoquidem & iis locis motum pene æquabilem eſſe conſtat, & errorculi ſi qui inter obſervandum admiſſi forent, evaneſcerent, cum duodecima vel ſextadecima pars differentiæ earum longitudinum pro diurno motu acciperetur.

Veluti anno 1734 die 23 Junii meridie ex diſtantia temporaria a Sole ad Sirium, quæ obſervata eſt hor. o. 26. 27 temporis medii, prodiit longitudo Solis grad. 1. 35. 26 Cancri. Die vero 8 Julii ex diſtantia a Sirio ad Solem hor. o 35. 27 longitudo fuit gr. 15. 53. 55 ejuſdem ſigni. Intervallum eſt dierum 15, differentia vero longitudinum gr. 14. 18. 29; idcirco motus diurnus Solis apogæi min. 57. 14. Similiter ex obſervationibus diei 25 Decembris erat meridie diſtantia a Sirio ad Solem hor. 11. 40. 5$\frac{1}{2}$ temporis medii, & longitudo Solis gr. 3. 33. 39 Capricorni; die vero 6 Januarii diſtantia a Sole ad Sirium hor. 11. 23. 4$\frac{1}{2}$, longitudo Capricorni 15. 47. 31; intervallum dierum 12, differentia longitudinum gr. 12. 13. 52 unde motus diurnus Solis perigæi min. 61. 9. Eſt ergo diſtantia perigæa ad apogæam ut radix quadratica min. 57. 14 ſive ſec. 3434 ad radicem quadraticam min. 61. 9 ſive ſec. 3669, quæ radices ſunt inter ſe ut 5860 & 6058. Harum differentiæ dimidium 99 eſt excentricitas, ſeu diſtantia foci in quo tellus ponitur a centro ellipſeos, ſi axis tranſverſus radicum illarum ſummæ æqualis ſtatuatur, nempe partium 11918, ac ſemiaxis partium earundem 5959; quapropter ubi ſemiaxis fiat, quemadmodum ſolet, partium 100000, erit excentricitas partium 1661. Sed celeritates illæ plurium annorum obſervationibus comprobandæ forent.

Potius ergo excentricitatem in Kepleri hypoteſi exquirendam arbitror indirectis tentaminibus (quod a Jacobo Caſſino præſtitum dixi) utcumque enim aſtronomicam exactitudinem aſſequamur geometricam morari nihil eſt neceſſe. Præſertim vero ex uſu eſſe poteſt ſi longitudo Solis exquiſite comprehenſa fuerit quo tempore is ab utroque abſide quadrante diſtat, nempe cum linea veri

motus lineæ abſidum ad perpendiculum incidit. Ejuſmodi obſervationes duas nactus ſum in multis quæ a Joſepho Marcheſio, Euſtachio Zanotto, Joſepho Roverſio, aliiſque ſociis in hoc publico obſervatorio actæ ſunt anno 1734 per tranſitus meridianos Solis ac Sirii, cujus ſtellæ aſcenſio æſtivo ejuſdem anni ſolſtitio, (quod ſæpe diximus) accurate definita fuerat. Die enim 28 Martii meridie, nempe æquali tempore hor. 0. 5 Sol præcedebat Sirium horis 6. 4 43 temporis medii; ac propterea longitudo Solis erat gr. 7. 35. 5 Arietis. Kalendis vero Octobris meridie, hoc eſt æquali tempore die 30 Septembris hor. 23 50 Sol ſequebatur Sirium horis 5. 54. 58; itaque verſabatur in grad. 8. 0. 15 Libræ. Ex hiſce obſervationibus Solaris orbis excentricitatem hoc pacto inveſtigavi.

Apogæi locum retinui eundem quem ſuperiori capite invenimus ad exitum Junii 1734, in grad. 8. 6. 30 Cancri. Hunc ipſum poſitum etſi in hac indagine accuratiſſime prænoſci minime neceſſe erat, tamen ex hiſce obſervationibus mire comprobari apparebit. Quoniam autem apogæum ſingulis annis progreditur ſec. 62, atque ideo trimeſtri ſpatio ſecundis præterpropter 15, fuerit ejus locus ſub finem Martii in gr. 8. 6. 15 Cancri; ac propterea quadrans circuli ab eo puncto incidet in grad. 8. 6. 15 Arietis. Cum ergo die 28 Martii hora 0. 5 æquali tempore Sol inventus ſit in Arietis grad. 7. 35. 5, ejuſque motus diurnus, ſatis per eos dies compertus, foret min. 59. 8, colligitur Solem gradibus ipſis 90 ab apogæo diſtitiſſe die 28 Martii hor. 13. 33 æquali tempore. Tempus autem quo Sol ad apogæum pervenerat ſupra ſtatuimus die 29 Junii hora 20. 1; intervallum ergo eſt dierum 93 hor. 6. 28; id quod & obſervatio alia Kalendis Octobris habita præclare confirmat. Cum enim eo meridie, ſive æquali tempore die 30 Septembris hor. 23. 50, deprehenſus fuerit locus Solis in gr. 8. 0. 15 Libræ, apogæum vero tunc eſſet in gr. 8. 6. 45 Cancri, ac motus Solis diurnus foret tunc min. 59. 8 conſequitur Solem die 1 Octobris hora 2 28 rurſum quadrante circuli ab apogæo abfuiſſe; intervallo ſcilicet dierum 93 hor. 6. 27 ex quo die 29 Junii hora 20. 1 apogæum attigerat, diſcrimine unius tantum minuti ab eo intervallo, quod ex obſervatione diei 28 Martii invenimus; id quod apogæum ipſum die 29 Junii in gradu 8. 6. 30 Cancri recte collocatum comprobat.

Perſpicuum eſt igitur ex utraque hac obſervatione tempus illud quo Sol gradus 90 hinc inde ab apſidum linea vero motu metitur, ſtatui poſſe dierum 93 horarum 6. 28. Eſt autem tempus totum quo ab apogæo digreſſus ad idem revertitur (annus nempe anomaliſticus) dierum 365 hor. 6. 14; ejuſque quadrans dierum 91 hor. 7. 33. 30, ſive ſecundorum 7889610; ſpatium igitur temporis quo Sol a linea apſidum gradibus 90 elongatur anni anomaliſtici quadrantem excedit die uno, horis 22. 54. 30, nempe ſecundis 168870. Quod ſi ergo ellipticam Solis orbitam cogitemus eſſe AMD (*Figura* 8) cujus centrum B, apogæum A, perigæum D, focus vero in quo tellus ſtatuitur K, ut excentricitas, cujus menſura quæritur, ſit BK, locus autem Solis ab apogæo gradibus 90 diſſiti S, ubi nempe normalis ad AB ex K ducta ellipſim ſecat; & ducatur ſemiaxis conjugatus BM; cum in Kepleri hypoteſi areæ ellipticæ a radio Solem vehente deſcriptæ temporibus ſint proportionales, manifeſtum eſt ita

eſſe

eſſe quadrantem ellipſeos ad aream KSMA, ut quadrans revolutionis anomaliſticæ ad intervallum temporis, quo Sol a puncto S ad apogæum A progreditur; & dividendo ita erit quadrans ellipſeos ad aream KSMB, ut quadrans anni anomaliſtici nempe ſecunda 7889610 ad exceſſum quo intervallum illud quadrantem ejus anni ſuperat nempe ad ſecunda 168870. Porro deſcripto ſuper AD ſemicirculo AEOD, & productis BM, KS ad ejus peripheriam in E, O, conſtat quadrantem circuli eſſe ad aream circularem KOEB ut quadrans ellipſeos ad aream ellipticam KSMB; ergo ut ſecunda 7789610 ad ſecunda 168870 ita quadrans circuli, cujus menſura (poſito radio BE partium 100000) eſt quamproxime 7854000000, ad aream KOEB, quæ propterea erit earundem partium 168107800.

Ad inveniendum ergo punctum K ſecandus eſt quadrans circuli BED per rectam KO diametro AD normalem ut portio circularis KOEB ſit partium 168107800 qualium quadrans 7854000000. Id autem ſubductis calculis quamproxime obtineri apparebit ſi tantum area illa circularis 168107800 applicetur ad ſemidiametrum circuli EB, nempe ſi ſuper BE fiat rectangulum BCFE areæ illi æquale; altitudo namque hujuſce rectanguli BC minus centeſima milleſima particula ſemidiametri BE deficiet a recta BK, quæ circularem aream rectangulo illi æqualem determinat. Erit enim BC partium 1681 qualium radius 100000; quapropter (ducta per punctum G ubi CF circulum ſecat, recta GH ad AE normali, junctaque GE) erit GH ſinus grad. 0. 57. 48, ejus vero ſinus complementi BH partium *99986*, & Sagitta EH partium 14; unde rectangulum HF 23534, & triangulum rectilineum GEF 11767; mixtilineum igitur circulare GFE minus eſt quam 11767, huic autem mixtilineo æquari oportet ſpatium KOGC, (ut ſcilicet ſpatium KOEB rectangulo BF ſit æquale) ſpatium igitur KOGC minus eſſe debet quam 11767. Rectangulum vero GCKI ſuper CG conſtructum nuſpiam duplum eſſe poteſt ſpatii KOGC, ac propterea minus eſt quam 23534. Ponatur ut maxime 23534. Cum ergo CG, quippe æqualis BH, inventa fuerit *99986* erit altitudo CK quotiens ex diviſione 23534 per *99986*, nempe minor quarta parte unius e centeſimis milleſimis partibus radii BE. Omnino igitur BC & BK ad ſenſum non differunt. Inventa eſt autem BC 1681, excentricitas ergo BK & ipſa eſt 1681 earum partium, qualium BE, ſive ſemiaxis ellipſeos AB ponitur 100000. Ex hac excentricitate ſupputavi in eadem hypoteſi æquationem maximam gr. 1. 55. 34. Hiræus habet 1. 55. 42, licet ex ejus logarithmis diſtantiæ apogeæ ac perigeæ Solis a tellure colligatur eadem excentricitas 1681; ſed videlicet ipſe æquationes a ſe traditas forte huic hypoteſi non adſtrinxit.

Solutionem aliam hujuſce problematis eamque magis directam tentaveram ex iiſdem datis, ope theorematis quod Jacobus Caſſinus in diſſertatione illa demonſtravit, nimirum: Si ſuper axe primario AD (*Figura 9*) ellipſeos parum excentricæ a planeta deſcriptæ APD, fiat ſemicirculus ACHD, atque ad centrum B ponatur angulus ABC anomaliæ mediæ, vel ejus reſiduo ad circulum æqualis, tum ex foco F in quo comprehenduntur areæ temporibus proportionales, ducatur recta FC eique per centrum æquidiſtans agatur BK, atque a puncto K ubi hæc ſemicirculo occurrit demittatur ad axem AD normalis KR,

ſecans ellipſin in puncto P, locus planetæ in orbita nihil ad ſenſum a puncto P diſcrepabit. Cum enim hoc in quolibet planetæ poſitu obtinere debeat, inde ſequitur, ubi planeta fuerit in S, in ipſa ſcilicet recta FSH ad axem normali quæ per focum F tranſit, rectam BH parallelam fore rectæ FE quæ ex foco F ducitur ad punctum peripheriæ E in quo puncto angulus ABE anomaliæ mediæ, ejuſve reſiduo æqualis eſt; quapropter cum ex dato tempore adventus Solis ad apogæum A, necnon ad punctum S inde quadrante diſtans, detur angulus ABE, problema huc redibat: Dato in peripheria ſemicirculi AED puncto E, invenire in ejus diametro AD punctum F, ex quo erecta normali FH, quæ peripheriæ occurrat in H, recta FE æquidiſtet rectæ BH quæ ex H ad centrum B ducitur; ita enim punctum F erit ipſe focus ellipſeos, & BF excentricitas. Sed cum in æquationem ad quartum gradum aſſurgentem incidiſſem, indaginem hanc abjeci.

Poſtmodum cum id totum ſignificaſſem Joſepho Bolſio Marcheſio quicum diuturna mihi ac jucundiſſima in aſtronomicis ſtudiis conſuetudo intercedit, aggreſſus eſt ipſe problematis ſolutionem; & poſita ſemidiametro circuli $= a$, ac BI (ſinu complementi anguli ABE) $= b$, excentricitate vero BF $= x$, æquationem invenit $x^4 - 2bx^3 + 2aabx - aabb = 0$ neque ipſum piguit, ut eſt in analyticis rationibus exercitatiſſimus, calculum abſolvere, ac radices quatuor hujuſce æquationis inveſtigare, quarum duas (A) imaginarias duas vero (B) reales comperit ea methodo quam vir acutiſſimus Georgius Campbell tradidit in diſſertatione quæ arithmeticæ univerſali Neutoni poſtremæ editionis ſubjecta eſt. Artificium vero univerſum quo haſce radices eruit non proſequor, ne ab inſtituto meo longius abeam

$$(A)\; x = \frac{b + \sqrt{bb + \sqrt[3]{4a^4bb - 4aab^4}} \pm \sqrt{2bb - \sqrt[3]{4a^4bb - 4aab^4} + \dfrac{2b^3 - 4aab}{\sqrt{bb + \sqrt[3]{4a^4bb - 4aab^4}}}}}{2}$$

$$(B)\; x = \frac{b - \sqrt{bb + \sqrt[3]{4a^4bb - 4aab^4}} \pm \sqrt{2bb - \sqrt[3]{4a^4bb - 4aab^4} + \dfrac{4aab - 2b^3}{\sqrt{bb + \sqrt[3]{4a^4bb - 4aab^4}}}}}{2}$$

Duarum ergo realium radicum (B) illam propoſitæ quæſtioni ſatisfacere invenit in qua poſtremum numeratoris membrum irrationale ſigno + afficitur. Itaque cum in obſervationibus duabus ante allatis tempus quo Sol a puncto S ad apogæum A progreſſus fuerat eſſet dierum 93 hor. 6. 27. 30, ac propterea angulus ABE, motus videlicet anomaliæ Solis huic tempori debitus, foret gr. 91. 55. 33, cujus ſinus complementi BI ($= b$) partium 3362, poſito radio

BD

BD ($=a$) partium 100000, ubi hoſce numeros pro lineis a & b in radice illa ſubrogavit, prodiit illi excentricitas BF ($=x$) partium earundem 1679, quantam fere ex priori tentamine inveneram.

Caput XXIV.

De media Solis longitudine, ejuſque æquationibus vel abſque excentricitatis notitia perſcrutandis.

INventa excentricitate, & comperto apogæi poſitu, ad conſtituendam certo aliquo tempore mediam Solis longitudinem, ex qua veluti radice aliorum omnium temporum longitudines mediæ eruantur, aſtronomi veras longitudines conſulere ſolent per ea tempora obſervatas in quæ tempora æquationes præterpropter maximas convenire conſtat; quod nempe iis locis æquationis quantitas dato tempore quamminimum mutetur, ac propterea non valde errari poſſit tametſi apogæi locus minus certus fuerit. Itaque æquationem maximam ex nota excentricitate in ea quam ſectantur hypoteſi ſupputatam vero Solis loco adjiciunt in priori ab apogæo ſemicirculo, in poſteriori ſubducunt, eoque longitudinem mediam eliciunt, quam deinde ad alia quælibet tempora proferunt.

Sed ubi verorum locorum obſervationes tres habeantur ita comparatæ, ut quæ medio loco acta eſt ab extremis & tempore & longitudine pariter diſtet, perfacile eſt, vel ſine excentricitatis notitia, mediarum longitudinum radices figere. Ex intervallo etenim temporis a prima ad poſtremam datur motus Solis medius; datur autem & verus, itaque datur utriuſque ſemidifferentia, quæ æquatio eſt alterutri extremarum competens, quandoquidem neceſſe eſt ut cum obſervationes iis conditionibus ſunt præditæ media earum in ipſam apſidum lineam incidat, ac propterea extremarum æquationes pares ſint. Æquatio igitur alterutri verarum longitudinum extremarum, pro caſuum diverſitate adjecta, aut ſubducta mediam longitudinem ad ejus obſervationis tempus patefaciet, atque ex ea epocha longitudines mediæ ad alia quælibet tempora deduci poterunt.

Veluti in allato nuper exemplo in quo obſervationes tres verarum Solis longitudinum retulimus, nempe: anno 1734 die 28 Martii hora 13.33 tempore æquali in gr. 8.6.15 Arietis; die 29 Junii hora 20.1 in gr. 8.6.30 Cancri; ac die primo Octobris hora 2.28 in gr. 8.6.45 Libræ, cum & longitudines exſquiſite, & tempora unius tantum minuti diſcrimine reſpondeant, intervallum autem temporis duarum extremarum ſit dierum 186 hor. 12.55, erit motus medius huic tempori debitus ſignorum 6.3.51.37; extremarum porro longitudinum verarum differentia eſt ſignorum 6.0.0.30; exceſſus igitur motus medii a vero graduum eſt 3.51.7, cujus differentiæ dimidium grad. 1.55 33 æquatio eſt, quæ alterutri earum longitudinum congruit. Si ergo hæc ſubducatur a longitudine vera prioris obſervationis ſign. 0.8.6.15 (quippe quæ

in

in ſecundum ab apogæo ſemicirculum incidit) fiet longitudo media ad diem 28 Martii 1734 hora 13. 33 tempore æquali in meridiano Bononiæ, ſignorum 0. 6. 10. 42; ex quo eruitur epocha longitudinis mediæ Solis anni 1734, nempe die 31 Decembris 1733 Bononiæ meridie æquali (qui meridianus Pariſienſi orientalior eſt minutis temporariis 36) ſignorum 9. 9. 52. 14. Caſſinianæ tabulæ, ac fere Hireanæ habent ſigna 9. 9. 52. 7, præclaro cum obſervationibus hiſce conſenſu. Anomaliæ autem mediæ quibus æquatio illa grad. 1. 55. 33 reſpondet, erunt ſignorum 8. 28. 4, & ſignorum 3. 1. 56; ac propterea hæc ipſa æquatio a maxima quamminimum deficere poteſt. Exquiſite ergo reſpondet æquationi maximæ gr. 1. 55. 34, quam nuper in Kepleriana hypoteſi ab excentricitate inventa partium 1681 ſupputavimus, licet ea excentricitate in hac poſtrema æquationis indagine uſi non fuerimus. Hoc pacto & apogæum, & excentricitatem, & longitudines medias, ſingula ſeorſim, ac inveſtigationibus longe diverſis inventa mire conſpirare invenimus.

Quod ſi eodem pacto aliæ atque aliæ obſervationes componantur, quæ conditiones eaſdem ſervent & apogæi locus & mediæ longitudines certius adhuc comprobabuntur, & præterea æquationes ad plurima anomaliæ puncta, nulla aſſumpta hypoteſi, ab experimentis inveniri poterunt.

Veluti meridie diei 22 Aprilis ejuſdem anni 1734, nempe 21 Aprilis hora 23. 59 tempore medio, Solis centrum præcedebat Sirium horis 4. 33. 17$\frac{1}{2}$ temporis medii, ac propterea longitudinem habebat gr. 2. 2. 2 Tauri. Apogæum ex ejus loco mox conſtituto erat tunc in grad. 8. 6. 19 Cancri; diſtabat igitur Sol ab apogæo ſignis 2. 6. 4. 17. Jam vero meridie d. 7 Septembris nempe die 6 hor. 23. 58 æquali, Sol ſequebatur Sirium hor. 4. 28. 43$\frac{1}{2}$, eratque in gradu 14. 30. 14 Virginis; apogæum vero in gr. 8. 6. 41 Cancri, quare Sol ab apogæo diſtabat ſign. 2. 6. 23. 33; hæcque diſtantia major eſt priore illa minutis 19. 16. Motus diurnus Solis die 7 Septembris erat min. 58. 23, quapropter minuta illa 19. 16 conficiebat horis 7. 55; idcirco die 6 hora 16. 3 erat in gr. 14. 10. 58 Virginis, diſtans iterum ab apogæo ſignis 2. 6. 4. 17 ut in priori obſervatione. Intervallum temporis ex die 21 Aprilis hor. 23. 59 in diem 6 Septembris hor. 16. 3 dierum eſt 137 hor. 16. 4, ejuſque intervalli medium incidit in diem 29 Junii hor. 20. 1 qua ipſa hora ac minuto ſupra invenimus Solem occupaſſe grad. 8. 6. 30 Cancri ubi apogæum ſtatuimus; ac propterea apogæum recte poſitum, ac omnia præclare cohærere liquet. Jam ex grad. 2. 2. 2. Tauri ad grad. 14. 10. 58 Virginis intercedunt ſigna 4. 12. 8. 56, qui fuit verus Solis motus intervallo dierum 137 hor. 16. 4; Medius vero motus eodem tempore eſt ſignorum 4. 15. 41. 35; differentia veri a medio gradum 3. 32. 39, cujus dimidium grad. 1. 46. 20 eſt æquatio utrilibet harum obſervationum tempori competens; quæ priori longitudini ſubducta, ſignis nempe 1. 2. 2. 2 conſtituit mediam longitudinem Solis die 21 Aprilis hor. 23. 59 ſignorum 1. 0. 15 42; ac propterea die 31 Decembris 1733 meridie æquali Bononiæ fuerit longitudo media ſignorum 9. 9. 52. 12: duobus haud amplius ſecundis ab ea deficiens quam nuper ex aliis obſervationibus duabus ſupputavimus. Anomaliæ

vero

vero mediæ quibus æquatio illa grad. 1. 46. 20 congruit erunt ſignorum 9. 22 9, & ſignorum 2. 7. 51.

Æquationes vero Solis hoc pacto ab experimentis deprehenſæ cum illis conferri poterunt quæ in hypoteſi qualibet ex conſtituta excentricitate in iiſdem anomaliæ locis computo inventæ fuerint, atque hoc pacto hypoteſeon examen inſtitui ac optimarum delectus haberi; tum vero Solis diſtantiæ a tellure ſingulis anomaliæ partibus reſpondentes calculis erui. Quin etiam explorare licebit an eadem perpetuo in eadem anomalia ſervetur æquationum menſura, an vero quicquam mutetur, ac propterea excentricitas ipſa aliis temporibus alia ſit; id quod haud temere ſuſpicari poſſumus, quando æquationem maximam a Caſſino olim definitam circiter grad. 1. 56. 52 haud majorem nunc invenimus grad. 1. 55. 33 vel 34. Obſervationes vero in hunc uſum ea potiſſimum methodo peragendæ videntur quam capite 20 tradidimus, conſtitutis videlicet partim ex hoc aliove gnomone, partim ex temporaria Solis ſtellarumque diſtantia, ſolſtitiorum articulis, ac reliquis ſervatis quæ ſubinde præcepimus; ea enim & maxime ſimplex ratio eſt & nihil ex aliorum fide aſſumit.

Hæc ſingula fuſius proſequi & pluribus exemplis illuſtrare decreveram, quin etiam æquationum tabulam ab obſervationibus conficere, atque huic opuſculo inſerere. Sed quando ad hoc & plurium annorum obſervationes eadem methodo peractæ requirebantur, & valetudine utebar minus commoda, maturandum duxi, quo ea ſaltem exequerer dum poſſem, quæ ad gnomonem hunc noſtrum ejuſque ſtatus diverſos pertinent; quorum plurima cum vel memoria retinerem, vel chartis nullo ordine mandaſſem, vix erat ut quiſquam alius poſt me aggredi, ac inſtrumenti ad hoc tempus hiſtoriam contexere poſſet.



OBSERVATIONES

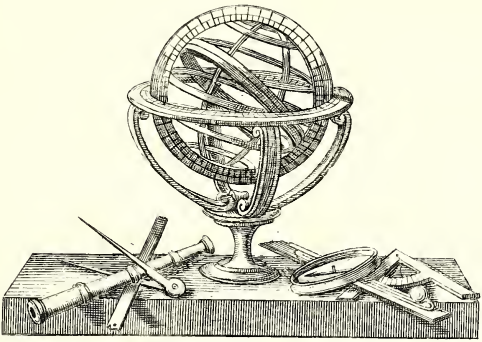
MERIDIANÆ SOLIS

Habitæ ad gnomonem Bononienſem

IN ÆDE DIVI PETRONII

Ex anno MDCLV

In annum MDCCXXXV.



Qui hiſce obſervationibus ad ineundos Solares calculos uti voluerit conſulat quæ de inſtrumenti ſtatu, ac correctionibus identidem illi adhibendis capite XII *diximus.*

De latitudine vero Bononiæ ad Divi Petronii ea perpendas quæ capite XVI, *de obliquitate eclipticæ quæ capite* XV *tradidimus.*

1655		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 21	Ricciolius Aſtron. ref. lib. 1. cap. 3. Conſentit Mezzavacca ephem. tom. 1. pag. 69, & Mengolus de refract. pag. 19, & ſeq. Caſſinus vero in ſpecimine obſervat. pag. 3 ait obſervatam ſibi hoc die diſtantiam centri Solis a vertice in D. Petronii ab altitudine pedum 71, ac inventam grad. 20. 59. 50 (viſam nempe, necdum a refractione & parallaxi correctam) quod ab hiſce numeris diſcrepat ſec. 14. Sed nimirum per id temporis nondum Caſſinus meridianam lineam marmoribus conſtraverat, quæ poſtquam adjecit, ac gnomoni ſupremam manum impoſuit, obſervationem hanc corrigendam agnovit, quemadmodum capite ſeptimo monuimus	38909 37870	21.15.38 20.44.30	21.15.57 20.44.49	31. 8	21. 0.23
Jun. 22	Ricciol. eodem loco. Mengolus de refract. pag. 19	38911 37871	21.15.42 20.44.32	21.16. 1 20.44.51	31.10	21. 0.26
Jul. 26	Ricciol. ibidem. Caſſinus vero in ſpecimine ait obſervatum ſibi quotidie Solem ex die 25 ad 30 Julii, ſed obſervationes dierum 25, 27, & 28 nuſpiam reperi	47197 46095	25.15.57 24.44.50	25.16.20 24.45.13	31. 7	25. 0.47
Jul. 29	Ricciol. ibidem	48671 47558	25.57.10 25.26. 5	25.57.34 25.26.28	31. 6	25.42. 1
Jul. 30	Ricciol. ib.	49187 48070	26.11.28 25.40.25	26.11.52 25.40.49	31. 3	25.56.21

1655		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Aug. 31	Caſſinus in ſpecimine pag. 22. Ricciol. Aſtr. ref. lib. 1. cap. 3	72909 71521	36. 5.44 35.34.22	36. 6.21 35.34.58	31.23	35.50.39
Sept. 15	Ricciol. eodem loco, ubi *dubiam* vocat obſervationem	89167 87554	41.43.21 41.12.13	41.44. 8 41.12.59	31. 9	41.28.33
Sept. 22	Ricciol. aſtr. ref. lib. 1. cap. 5 num. 13. Conſentit Mengol. in anno pag. 272. Mendum ergo irrepſit lib. 1. cap. 3 aſtron. ref., ubi tangens limbi ſup. correcta a penumbra paullo aliter conſignatur, nimirum 96344	98133 96334	44.27.37 43.55.49	44.28.28 43.56.40	31.48	44.12.34
Sept. 23	Ricciol. ib. Mengolus in anno pag. 272	99483 97672	44.51. 5 44.19.31	44.51.57 44.20.22	31.35	44.36. 9
Sept. 24	Ricciol. ib.	100853 99016	45.14.36 44.43. 0	45.15.28 44.43.52	31.36	44.59.40
1656						
Jan. 1	Ex literis Maraldi. Conſentit Ricciol. aſtron. ref. lib. 1. cap. 3, & Caſſinus in epiſtola ad finem ephemerid. Montanarii 1666	244590 238210	67.45.47 67.13.39	67.48. 1 67.15.49	32.12	67.31.55
Jan. 2	Ex literis Maraldi. Caſſinus ib. Ricciol. ib. Subdens *minus certa*	243520 237200	67.40.29 67. 8.26	67.42.43 67.10.36	32. 7	67.26.40
Jan. 3	ex literis Maraldi	242410 236090	67.34.58 67. 2.39	67.37.13 67. 4.48	32.25	67.21. 0
Jan. 4	ibid.	241160 234910	67.28.41 66.56.27	67.30.53 66.58.35	32.18	67.14.44

Jan.

1656		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 5	Ex literis Maraldi. Caſſin. ib. Ricciol. ib. ubi addit *certior ſed non certa*	239800 233740	67.21.48 66.50.15	67.23.59 66.52.23	31.36	67. 8.11
Jan. 6	Ex literis Maraldi	238525 232365	67.15.16 66.42.54	67.17.26 66.45. 1	32.25	67. 1.13
Jan. 9	Ricciol. ib. ſubdens *lubrica*. Conſentit Caſſin. ib. In literis autem Maraldi tangentes a penumbra correctæ 232320, & 226455, quæ nimis ab hiſce diſcrepant. Fortaſſe ergo ad alium diem attinent	233900 228100	66.51. 6 66.19.38	66.53.13 66.21.42	31.31	66.37.28
*Jan.*15	Ricciol. ib.	223270 217790	65.52.28 65.20.15	65.54.25 65.22.14	32.11	65.38.20
*Jan.*17	Ex literis Maraldi	219330 214037	65.29.24 64.57.24	65.31.24 64.59.20	32. 4	65.15.22
*Jan.*21		211065 206090	64.38.57 64. 6.58	64.40.50 64. 8.49	32. 1	64.20.50
*Jan.*22		208925 204050	64.25.20 63.53.30	64.27.13 63.55.20	31.53	64.11.17
*Jan.*28		195760 191340	62.56.28 62.24.26	62.58.13 62.26. 9	32. 4	62.42.11
*Jan.*30		191238 187030	62.23.58 61.52. 4	62.25.41 61.53.45	31.56	62. 9.43
*Jan.*31		189065 184900	62. 7.29 61.35.38	62. 9.11 61.37.18	31.53	61.53.15
Febr. 1		186840 182735	61.50.37 61.18.39	61.52.19 61.20.19	32. 0	61.36.19
Febr. 2		184600 180575	61.33.18 61. 1.22	61.34.58 61. 3. 0	31.58	61.18.59
Febr. 7		173550 169884	60. 2.57 59.31. 3	60. 4.31 59.32.35	31.56	59.48.33

Fe-

1656		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Febr. 9	Extant in literis Maraldi tangentes limborum Lunę hac nocte obſervatæ, necdum, ut arbitror, a penumbra correctæ, 59874, 58471					
Feb. 16	ex iiſdem literis	154505 151333	57. 5.17 56.32.37	57. 6.39 56.33.57	32.42	56.50.18
Feb. 18	ex iiſdem; verum obſervatio aut vitio eſt habita, aut ad hunc diem non attinet	146370 143400	55.39.33 55. 6.36	55.40.50 55. 7.51	32.59	55.24.20
Feb. 21	ex iiſdem *dubia*; ſed proculdubio in hunc diem non convenit	140450 138625				
Feb. 22	ex iiſdem *exacta*	142506 139733	54.56.30 54.24.38	54.57.45 54.25.51	31.54	54.41.48
Feb. 23	ex iiſdem	140570 137875	54.34.21 54. 2.49	54.35.35 54. 4. 1	31.34	54.19.48
Mar. 14		106861 104915	46.53.59 46.22.27	46.54.55 46.23.22	31.33	46.39. 9
Mar. 15		105410 103480	46.30.31 45.58.47	46.31.26 45.59.41	31.45	46.15.33
Mar. 16		103960 102060	46. 6.44 45.35. 3	46. 7.38 45.35.56	31.42	45.51.47
Mar. 19	Caſſin. in ſpecim. p. 5. Ricciol. aſtr. ref. lib. 1. cap. 3. Mengol. in anno p. 272	99762 97940	44.55.54 44.24.14	44.56.46 44.25. 5	31.41	44.40.55
Mar. 20	Caſſin. in ſpecim. p. 6. Mengol. in anno p. 272	98380 96600	44.31.56 44. 0.33	44.32.47 44. 1.24	31.23	44.17. 5
Mar. 21	Caſſin. ibidem. Ricciol. aſtron. lib. 1. cap. 2	97048 95275	44. 8.30 43.36.50	44. 9.21 43.37.44	31.37	43.53.32

Mar.

1656		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Mar. 22	Caſſin. in ſpecimine pag. 7	95712 93981	43.44.42 43.13.22	43.45.32 43.14.11	31.21	43.29.52
Mar. 23	Caſſin. in ſpecim. pag. 8. Ricciol. Aſtron. lib. 1. cap. 3	94407 92683	43.21. 8 42.49.31	43.21.57 42.50.19	31.38	43. 6. 8
Apr. 11	Caſſin. in ſpec. pag. 22. Ricciol. aſtron. lib. 1. cap. 3	72921 71529	36. 6. 0 35.34.33	36. 6.37 35.35. 9	31.28	35.50.53
Jun. 21	Caſſinus ad finem ephem. Malvaſiæ diſtantiam centri Solis a vertice hoc die ſibi obſervatam memorat gr. 21.0 4, quæ a refractione caſtigata eſt gr. 21.0.23. Tangentes unde eam ſupputavit nuſpiam reperi					21. 0.23
Jul. 23	Ricciol. aſtron. ref. lib. 1. c. 3	46192 45098	24.47.36 24.16.27	24.47.59 24.16.47	31.12	24.32.23
Aug. 8	Ricciol. ib.	54944 53770	28.47.10 28.16. 2	28.47.38 28.16.29	31. 9	28.32. 4
Aug. 9		55605 54426	29. 4.35 28.33.27	29. 5. 3 28.33.55	31. 8	28.49.29
Aug. 20		63775 62513	32.31.40 32. 0.39	32.32.12 32. 1.11	31. 1	32.16.42
Sept. 22		99130 97335	44.44.59 44.13.35	44.45.50 44.14.26	31.24	44.30. 8
Sept. 23		100495 98670	45. 8.29 44.36.59	45. 9.21 44.37.50	31.31	44.53.35
Sept. 24		101872 100020	45.31.53 45. 0.21	45.32.46 45. 1.13	31.33	45.16.59
Sept. 29		109080 107090	47.29.12 46.57.39	47.30. 9 46.58.35	31.34	47.14.22

Oct.

1656		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 15	Ex literis Maraldi. Conſentit Ricciol. aſtron. ref. lib. 1. cap. 3.	135641 133041	53.36. 3 53. 4.11	53.37.14 53. 5.21	31.53	53.21.17
Oct. 16	ex literis Maraldi	137440 134900	53.57.39 53.27. 3	53.58.51 53.28.14	30.37	53.43.33
Oct. 17	ex iiſdem	139351 136660	54.20.11 53.48.20	54.21.24 53.49.32	31.52	54. 5.28
Oct. 19		143130 140350	55. 3.34 54.31.48	55. 4.49 54.33. 1	31.48	54.48.55
Oct. 20		145040 142233	55.24.54 54.53.24	55.26.11 54.54.39	31.32	55.10.25
Oct. 26		157060 153900	57.30.55 56.59. 7	57.32.19 57. 0.29	31.50	57.16.24
Oct. 27		159070 155910	57.50.40 57.19.26	57.52. 5 57.20.49	31.16	57.36.27
Nov. 10		189490 185310	62.10.41 61.38.49	62.12.22 61.40.29	31.53	61.56.25
Nov. 11	ex iiſdem, conſentiente Ricciolio aſtron. lib. 1. cap. 3	191670 187430	62.26.51 61.55. 7	62.28.35 61.56.49	31.46	62.12.42
Nov. 20	ex literis Maraldi	211355 206350	64.40.46 64. 8.40	64.42.41 64.10.32	32. 9	64.26.36
Nov. 23	ex iiſdem. Conſentit Ricciol. loco memorato	217530 212300	65.18.41 64.46.41	65.20.40 64.48.36	32. 4	65. 4.38
Nov. 27	ex iiſdem literis	225390 219830	66. 4.27 65.32.22	66. 6.30 65.34.22	32. 8	65.50.26
Nov. 28		227230 221600	66.14.48 65.42.44	66.16.52 65.44.45	32. 7	66. 0.48
Dec. 3		235600 229670	67. 0. 5 66.28.17	67. 2.14 66.30.23	31.51	66.46.19

Dec.

1656		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Dec. 7	Ex literis Maraldi.	241230 235000	67.29. 2 66.56.55	67.31.14 66.59. 3	32.11	67.15. 8
Dec. 12		246420 239990	67.54.44 67.22.45	67.56.59 67.24.56	32. 3	67.40.58
Dec. 13		247245 240740	67.58.43 67.26.34	68. 0.59 67.28.46	32.13	67.44.52
Dec. 14		247910 241380	68. 1.56 67.29.48	68. 4.12 67.32. 0	32.12	67.48. 6
Dec. 21	Caſſinus ad finem Ephemeridum Malvaſiæ. Conſentiunt literæ Maraldi, Mezzavacca Ephem. tomo p. pag. 70 Ricciol. Aſt. reform. lib. 1. cap. 3, & Mengol. de refract. pag. 19, & ſeqq.	250050 243440	68.12. 9 67.40. 5	68.14.26 67.42.19	32. 7	67.58.22
Dec. 24	Ex literis Maraldi.	249430 242870	68. 9.13 67.37.15	68.11.30 67.39.28	32. 2	67.55.29
Dec. 25	Ex iiſdem.	249040 242490	68. 7.21 67.35.22	68. 9.37 67.37.34	32. 3	67.53.35
Dec. 26		248540 242030	68. 4.57 67.33. 3	68. 7.13 67.35.15	31.58	67.51.14
1657						
Jan. 10	Ex literis Maraldi. Conſentit Ricciol. Aſtr. ref. lib. 1. cap. 3.	230966 225185	66.35.21 66. 3.19	66.37.27 66. 5.22	32. 5	66.21.24
Jan. 11	Ex iiſdem literis.	229220 223500	66.25.49 65.53.42	66.27.54 65.55.44	32.10	66.11.49
Jan. 12		227430 221770	66.15.54 65.43.43	66.17.58 65.45.44	32.14	66. 1.51
Jan. 13		225575 220010	66. 5.30 65.33.25	66. 7.33 65.35. 0	32.33	65.51.16

1657		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
*Jan.*19	ex literis Maraldi	213600 208510	64.54.45 64.22.41	64.56.41 64.24.34	32. 7	64.40.38
*Jan.*21		209350 204470	64.28. 3 63.56.17	64.29.57 63.58. 7	31.50	64.14. 2
*Jan.*24		202840 198170	63.45.24 63.13.25	63.47.14 63.15.12	32. 2	63.31.13
*Jan.*28		194000 189670	62.43.50 62.12. 1	62.45.35 62.13.44	31.51	62.29.40
*Jan.*29	Ex iiſdem literis. Conſentit Ricciol. Aſtr. ref. lib. 1. c. 3	191790 187510	62.27.44 61.55.43	62.29.28 61.57.24	32. 4	62.13.26
Feb. 5	ex iiſdem literis	176240 172465	60.25.45 59.53.37	60.27.21 59.55.10	32.11	60.11.15
Feb. 10	Ex iiſdem. Ricciol. loco pręd.	165380 161950	58.50.24 58.18.21	58.51.53 58.19.48	32. 5	58.35.50
Feb. 11	ex iiſdem literis	163250 159680	58.30.36 57.36.35	58.32. 4 57.58. 1	34. 3	
Feb. 13		159030 155820	57.50.16 57.18.32	57.51.41 57.19.55	31.46	57.35.48
Feb. 19		146850 143960	55.44.47 55.12.53	55.46. 5 55.14. 9	31.54	55.30. 6
Feb. 28		129950 127490	52.25.15 51.53.25	52.26.23 51.54.31	31.52	52.10.27
*Mar.*16	Ex iiſdem. Ricciol. loco præd.	104275 102370	46.11.56 45.40.15	46.12.50 45.41. 8	31.42	45.56.59
Mar. 18	Ex iiſdem literis	101430 99590	45.24.24 44.52.56	45.25.16 44.53.47	31.29	45. 9.32
*Mar.*19	Ex iiſdem. Ricciol. eod. loco	100050 98220	45. 0.52 44.29. 7	45. 1.44 44.29.58	31.46	44.45.51
*Mar.*26	ex literis Maraldi	90850 89220	42.15.18 41.44.22	42.16. 5 41.45. 9	30.56	42. 0.37

Mar.

1657		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Mar. 28	ex iiſdem literis,& Ricciol. loco prædicto	88420 86805	41.28.59 40.57.34	41.29.46 40.58.20	31.26	41.14. 3
1658						
Mar. 20	Ricciol. Aſtron. ref. lib. 1. cap.8. Ex literis autem Maraldi colliguntur tangentes hujus diei correctæ a Penumbra 99125, & 97213, e quibus eadem altitudo centri Solis elicitur atque ex Riccioliani, ſed diameter Solis prodit juſto major; nempe ob correctionem tangentium contrario ac debuit modo adhibitam	99075 97263	44.44. 2 44.12.18	44.44.54 44.13. 9	31.45	44.29. 2
Apr. 2	Ex Maraldi literis	82860 81350	39.38.43 39. 7.43	39.39.26 39. 8.26	31. 0	39.23.56
Apr. 3	ex iiſdem	81745 80240	39.15.51 38.44.37	39.16.34 38.45.19	31.15	39. 0.57
Apr. 4	ex iiſdem, & Ricciol. loco prædicto	80640 79140	38.52.58 38.21.29	38.53.41 38.22.11	31.30	38.37.56
Apr. 5	ex iiſdem literis	79562 78090	38.30.23 37.59.10	38.31. 5 37.59.51	31.14	38.15.28
Apr. 12		72400 71050	35.54.16 35.23.38	35.54.52 35.24.13	30.39	35.39.33
Apr. 13		71438 70070	35.32.29 35. 1. 8	35.33. 5 35. 1.42	31.22	35.17.24
Apr. 14		70450 69150	35. 9.53 34.39.50	35.10.28 34.40.25	30. 3	34.55.27
Apr. 15		69580 68220	34.49.49 34.18. 7	34.50.24 34.18.42	31.42	34.34.33

1658		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 23	Hæc obſervatio conſignatur a Maraldo d. 22, vere tamen ad d. 23 ſpectat	62680 61410	32. 4.46 31.33.15	32. 5.18 31.33.46	31.32	31.49.32
Apr. 24	Hæc etiam obſervatio uno die in Maraldi literis præponitur	61873 60630	31.44.46 31.13.42	31.45.17 51.14.12	31. 5	31.29.45
Apr. 26		60300 59090	31. 5.25 30.34.40	31. 5.55 30.35.10	30.45	30.50.33
Maj. 2		55990 54770	29.14.41 28.42.35	29.15. 9 28.43. 3	32. 6	28.59. 6
Maj. 22		45080 44000	24.15.57 23.44.59	24.16.19 23.45.20	30.59	24. 0.50
Jun. 20	Ricciol. Aſtron. ref. lib. 1 cap. 3 *Ex Caſſini ſcheda*. Mengol. de refract. pag. 19, & ſeq.	38912 37876	21.15.44 20.44.41	21.16. 3 20.45. 0	31. 3	21. 0.32
Jun. 21	Ricciol. eodem loco. Sed Mengolus habet 38909, & 37868, & Mezzavacca tomo 1 Ephem. pag. 70 ab utroque diſcrepans 38906, & 37868	38911 37871	21.15.42 20.44.32	21.16. 1 20.44.51	31.10	21. 0.26
Dec. 18	ex literis Maraldi	249540 242960	68. 9.44 67.37.42	68.12. 1 67.39.54	32. 7	67.55.58
Dec. 19	ex iiſdem	249790 243200	68.10.55 67.38.54	68.13.12 67.41. 7	32. 5	67.57.10
Dec. 20		249950 243350	68.11.41 67.39.39	68.13.58 67.41.53	32. 5	67.57.56
Dec. 21		250020 243405	68.12. 1 67.39.55	68.14.18 67.42. 9	32. 9	67.58.13

Jan.

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1659			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 6	Ex Maraldi literis	237970 231940	67.12.25 66.40.31	67.14.35 66.42.38	31.57	66.58.36
Jan. 12	ex iiſdem	228295 222602	66.20.42 65.48.31	66.22.47 65.50.33	32.14	66. 6.40
Jan. 15		222650 217225	65.48.49 65.16.51	65.50.51 65.18.49	32. 2	65.34.50
Jan. 16		220725 215340	65.37.37 65. 5.26	65.39.37 65. 7.23	32.14	65.23.30
Jan. 19	ex iiſdem literis. Conſentit Ricciol. Aſtron. ref. lib. 1 c. 3 Caſſin. in epiſt. ad finem ephem. Montanar. 1666	214580 209460	65. 0.47 64.28.45	65. 2.44 64.30.39	32. 5	64.46.41
Jan. 21	ex iiſdem literis	210390 205450	64.34.40 64. 2.46	64.36.34 64. 4.37	31.57	64.20.36
Jan. 23		206090 201300	64. 6.57 63.34.59	64. 8.48 63.36.48	32. 0	63.52.48
Jan. 25		201700 196840	63.37.42 63. 4. 5	63.39.31 63. 5.51	33.40	
Jan. 27		197290 192800	63. 7.16 62.35. 8	63. 9. 2 62.36.52	32.10	62.52.57
Jan. 28		195060 190700	62.51.27 62.19.42	62.53.12 62.21.25	31.47	62.37.19
Jan. 29		192850 188540	62.35.30 62. 3.32	62.37.14 62. 5.14	32. 0	62.21.14
Jan. 30		190610 186365	62.19. 1 61.46.58	62.20.44 61.48.39	32. 5	62. 4.42
Jan. 31		188370 184235	62. 2.15 61.30.27	62. 3.57 61.32. 7	31.50	61.48. 2
Febr. 1		186120 182060	61.45. 5 61.13.17	61.46.46 61.14.56	31.50	61.30.51

Febr.

1659		*Tangen- tes corre ctæ a pe numbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera lim borum*	*Diam. app. Solis*	*Diſt. a vertice vera cen tri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 6	ex literis Maraldi	175080 171350	60.15.59 59.43.56	60.17.34 59.45.29	32. 5	60. 1.31
Feb. 8	ex iiſdem literis. Et Ricciol. eodem loco	170710 167150	59.38.19 59. 6.34	59.39.51 59. 8. 4	31.47	59.23.57
Feb. 16	ex iiſdem literis	153825 150750	56.58.21 56.26.30	56.59.42 56.27.50	31.52	56.43.46
Feb. 17		151800 148780	56.37.29 56. 5.31	56.38.49 56. 6.50	31.59	56.22.49
Feb. 18		149790 146820	56.16.22 55.44.27	56.17.41 55.45.45	31.56	56. 1.43
Feb. 28		130810 128335	52.36.12 52. 4.26	52.37.20 52. 5.33	31.47	52.21.27
Mar. 1		129020 126600	52.13.18 51.41.43	52.14.25 51.42.50	31.35	51.58.38
Mar. 4		123830 121520	51. 4.37 50.32.55	51. 5.41 50.33.59	31.42	50.49.50
Mar. 7		118830 116625	49.55. 5 49.23.19	49.56. 7 49.24.20	31.47	49.40.13
Mar. 8		117200 115030	49.31.40 48.59.54	49.32.41 49. 0.54	31.47	49.16.47
Mar. 9		115600 113470	49. 8.19 48.36.38	49. 9.19 48.37.37	31.42	48.53.28
Mar. 12		110920 108880	47.57.50 47.26. 4	47.58.47 47.27. 1	31.46	47.42.54
Mar. 28	ex literis Maraldi	89010 87370	41.40.20 41. 8.38	41.41. 7 41. 9.24	31.43	41.25.15
Mar. 29	ex iiſdem, & Ricciol. Aſtron. ref. lib. 1 cap. 3	87800 86185	41.16.59 40.45.23	41.17.45 40.46. 8	31.37	41. 1.56
April. 1	ex iiſdem literis	84275 82730	40. 7.21 39.36. 4	40. 8. 5 39.36.47	31.18	39.52.26

Maj.

1659		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ″ ′	G ″ ′	″ ′	G ″ ′
Maj. 15	ex iiſdem, & Ricciol. eo dem loco	48420 47300	25.50.10 25.18.51	25.50.34 25.19.14	31.20	25.34.54
Maj. 23	ex iiſdem literis	44795 43695	24. 7.48 23.36.10	24. 8.10 23.36.31	31.39	23.52.20
Maj. 24		44400 43300	23.56.28 23.24.46	23.56.50 23.25. 7	31.43	23.40.58
Jun. 3		41200 40140	22.23.30 21.52.14	22.23.50 21.52.33	31.17	22. 8.12
Jun. 4		40945 39905	22.16. 0 21.45.16	22.16.20 21.45.35	30.45	22. 0.58
Jun. 6		40460 39470	22. 1.42 21.32.21	22. 2. 2 21.32.40	29.22	21.47.21
Jun. 28		39230 38200	21.25.12 20.54.25	21.25.31 20.54.43	30.48	21.10. 7
Jul. 3		39870 38837	21.44.14 21.13.29	21.44.33 21.13.48	30.45	21.29.11
Jul. 4		40039 39007	21.49.14 21.18.34	21.49.33 21.18.53	30.40	21.34.13
Jul. 7		40630 39590	22. 6.42 21.35.55	22. 7. 2 21.36.14	30.48	21.51.38
Jul. 8		40860 39810	22.13.30 21.42.26	22.13.50 21.42.45	31. 5	21.58.17
Jul. 9		41080 40050	22.19.58 21.49.34	22.20.18 21.49.53	30.25	22. 5. 6
Jul. 10		41350 40300	22.27.55 21.56.58	22.28.15 21.57.17	30.58	22.12.46
Jul. 15		42800 41740	23.10.15 22.39.21	23.10.36 22.39.41	30.55	22.55. 8
Jul. 18		43850 42785	23.40.39 23. 9.49	23.41. 0 23.10.10	30.50	23.25.35

Aug.

1659		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 6	ex iiſdem literis	53193 52050	28. 0.36 27.29.49	28. 1. 3 27.30.15	30.48	27.45.39
Aug. 8		54465 53290	28.34.30 28. 3.11	28.34.58 28. 3.38	31.20	28.19.18
Aug. 11		56450 55270	29.26.41 28.55.46	29.27. 9 28.56.14	30.55	29.11.42
Aug. 14	ex iiſdem literis. Ricciolius autem Aſtron. lib. 1 cap. 3 tangentem limbi inferioris conſignat 58620, exceſſu partium 50; itaque ut apparet correctionem a penumbra hic prætermiſit. De ſuperiori limbo cum Maraldo conſentit	58570 57350	30.21.28 29.50. 3	30.21.57 29.50.31	31.26	30. 6.14
Aug. 16	ex iiſdem literis	60045 58830	30.58.58 30.28. 6	30.59.28 30.28.35	30.53	30.44. 2
Aug. 18		61580 60340	31.37.28 31. 6.24	31.37.59 31. 6.54	31. 5	31.22.26
Aug. 23		65650 64370	33.17. 6 32.46.10	33.17.39 32.46.42	30.57	33. 2.10
Aug. 25		67390 66075	33.58.33 33.27.17	33.59. 7 33.27.50	31.11	33.43.25
Aug. 30		71970 70570	35.44.33 35.12.38	35.45. 9 35.13.13	31.56	35.29.11
Sept. 8	ex iiſdem, ubi hæc obſervatio notatur die 9, vere tamen ad diem 8 pertinet	81170 79660	39. 3.59 38.32.27	39. 4.42 38.33. 9	31.33	38.48.55
Nov. 29	ex iiſdem literis	227685 222033	66.17.20 65.45.14	66.19.24 65.47.15	32. 9	66. 3.19
Nov. 30		229450 223733	66.27. 4 65.55. 2	66.29. 9 65.57. 4	32. 5	66.13. 7

1659		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ″ ′	G ″ ′	″ ′	G ″ ′
Dec. 1	ex iiſdem literis	231170 225382	66.36.27 66. 4.25	66.38.33 66. 6.28	32. 5	66.22.31
Dec. 2		232870 227014	66.45.36 66.13.35	66.47.43 66.15.39	32. 4	66.31.41
Dec. 3		234470 228530	66.54. 7 66.22. 1	66.56.15 66.24. 6	32. 9	66.40.10
Dec. 4		236019 230025	67. 2.16 66.30.17	67. 4.25 66.32.23	32. 2	66.48.24
Dec. 7		240250 234050	67.24. 5 66.51.54	67.26.16 66.54. 2	32.14	67.10. 9
Dec. 8		241535 235300	67.30.34 66.58.30	67.32.46 67. 0.39	32. 7	67.16.42
Dec. 9		242740 236430	67.36.36 67. 4.25	67.38.49 67. 6.34	32.15	67.22.41
Dec. 18		249470 242870	68. 9.24 67.37.15	68.11.41 67.39.28	32.13	67.55.35
Dec. 20		249915 243300	68.11.31 67.39.24	68.13.48 67.41.38	32.10	67.57.43
1660						
Oct. 9	ex iiſdem Maraldi literis	125103 122740	51.21.48 50.49.45	51.22.53 50.50.49	32. 4	51. 6.51
Oct. 11		128530 126556	52. 6.58 51.41. 8	52. 8. 5 51.42.14	25.51	
Oct. 12		130265 127830	52.29.16 51.57.51	52.30.24 51.58.58	31.26	52.14.41
Oct. 14		133852 131550	53.14.13 52.45.33	53.15.23 52.46.42	28.41	
Oct. 16		136522 134885	53.46.40 53.26.52	53.47.51 53.28. 2	19.49	

1660		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Oct. 25	ex iiſdem literis	155059 151965	57.10.53 56.39.12	57.12.15 56.40.33	31.42	56.56.24
*Nov.*10		189489 185300	62.10.40 61.38.45	62.12.22 61.40.25	31.57	61.56.23
*Nov.*12		193950 189610	62.43.28 62.11.24	62.45.13 62.13.16	31.57	62.29.14
*Nov.*13		196130 191730	62.59. 4 62.27.18	63. 0.50 62.29. 1	31.49	62.44.56
*Nov.*14	Ex literis Maraldi. Conſentit Ricciol. Aſtr. ref. lib. 1 cap. 3	198350 193860	63.14.41 62.42.49	63.16.28 62.44.34	31.54	63. 0.31
*Nov.*15	ex iiſdem literis	200540 195990	63.29.48 62.58. 5	62.31.36 62.59.51	31.45	63.15.43
*Nov.*17		204915 200170	63.59.14 63.27.17	64. 1. 5 63.29. 5	32. 0	63.45. 5
*Nov.*18		207055 202250	64.13.16 63.41.26	64.15. 8 63.43.15	31.53	63.59.11
*Nov.*19		209210 204330	64.27.10 63.55.22	64.29. 3 63.57.12	31.51	64.13. 7
*Nov.*20		211315 206370	64.40.31 64. 8.48	64.42.26 64.10.40	31.46	64.26.33
*Nov.*24		219545 214241	65.30.42 64.58.43	65.32.42 65. 0.30	32.12	65.16.36
*Nov.*27		225280 219800	66. 3.50 65.32.11	66. 5.53 65.34.11	31.42	65.50. 2
*Nov.*30		230771 225005	66.34.17 66. 2.17	66.36.23 66. 4.20	32. 3	66.20.21
Dec. 1		232425 226594	66.43.13 66.11.14	66.45.20 66.13.18	32. 2	66.29.19
Dec. 3		235598 229640	67. 0. 4 66.28. 7	67. 2.13 66.30.13	32. 0	66.46.13

Dec.

1660		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 9	ex iiſdem literis	243547 237185	67.40.37 67. 8.21	67.42.50 67.10.31	32.19	67.26.40
Dec. 10		244570 238170	67.45.41 67.13.26	67.47.54 67.15.36	32.18	67.31.45
Dec. 11		245565 239100	67.50.34 67.18.13	67.52.48 67.20.24	32.24	67.36.36
Dec. 14	Huic, & ſequenti obſervationi in Maraldi literis dies adſcriptus non erat, ſed ex reliquarum ſerie, & ex computatione longitudinis Solis compertum habeo pertinere ad dies 14, & 15	247830 241320	68. 1.33 67.29.29	68. 3.49 67.31.41	32. 8	67.47.45
Dec. 15		248465 241900	68. 4.36 67.32.24	68. 6.52 67.34.37	32.15	67.50.44
Dec. 20	ex iiſdem literis	249975 243340	68.11.48 67.39.36	68.14. 5 67.41.50	32.15	67.57.57
Dec. 21	ex iiſdem, eratque adſcriptum *Sol trepidus*	249975 243340	68.11.48 67.39.36	68.14. 5 67.41.50	32.15	67.57.57
Dec. 30	ex iiſdem	245590 239165	67.40.41 67.18.33	67.52.55 67.20.44	32.11	67.36.49
1661						
Jan. 18	Ricciol. Aſtron. ref. lib. 1 cap. 3	215572 210420	65. 6.51 64.34.52	65. 8.48 64.36.46	32. 2	64.52.47
Jan. 24	Ricciol. eodem loco ubi perperam hanc obſervationem conſignat die 19 cum ad diem 24 pertineat	202770 198110	63.44.56 63.13. 0	63.46.46 63.14.47	31.59	63.30.46

1663		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
*Jun.*20	Ex literis Maraldi, adjectis obſervatorum nominibus *Comes Zani*, & *Montanarius*	38920 37888	21.15.58 20.45. 2	21.16.17 20.45.21	30.56	21. 0.49
*Jun.*21	Ex iiſdem. *Marchio Malvaſia, Comes Zani, & Montanarius*	38915 37878	21.15.49 20.44.44	21.16. 8 20.45. 3	31. 5	21. 0.36
*Jun.*22	Ex literis Maraldi. obſervatores iidem	38915 37878	21.15.49 20.44.44	21.16. 8 20.45. 3	31. 5	21. 0.36
*Jun.*23	Ex iiſdem. obſervatores iidem	38920 37900	21.15.58 20.45.24	21.16.17 20.45.43	30.34	21. 1. 0
Dec. 21	Mezzavacca Ephem. tomo p. pag. 71. Conſentit Mengol. de refr. pag. 19	249970 243357	68.11.46 67.39.41	68.14. 3 67.41.55	32. 8	67.57.59
Dec. 22	Mengol. de refract. pag. 19	249950 243328	68.11.41 67.39.32	68.13.58 67.41.46	32.12	67.57.52
1665						
*Jun.*21	Mezzavacca Ephem. tomo p. pag. 70. Mengol. de refr. pag. 19	38905 37869	21.15.31 20.44.28	21.15.50 20.44.47	31. 3	21. 0.18
1666						
Jan. 7	ex literis Maraldi	236072 230085	67. 2.33 66.30.33	67. 4.42 66.32.39	32. 3	66.48.40
*Jan.*8	ex iiſdem	234516 228585	66.54.20 66.22.19	66.56.28 66.24.24	32. 4	66.40.26
*Jan.*9		232920 227069	66.45.53 66.13.54	66.48. 0 66.15.58	32. 2	66.31.59
*Jan.*11		229511 223796	66.27.24 65.55.24	66.29.30 65.57.27	32. 3	66.13.28

Jan.

1666		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 13	Ex Maraldi literis	225895 220318	66. 7.19 65.35.14	66. 9.23 65.37.15	32. 8	65.53.19
Jan. 14	ex iiſdem	223978 218475	65.56.26 65.24.20	65.58.29 65.26.19	32.10	65.42.24
Jan. 17		218090 212852	65.22. 2 64.50. 7	65.24.21 64.52. 3	32.18	65. 8.12
Jan. 19		213978 208852	64.57. 6 64.24.52	64.59. 2 64.26.45	32.17	64.42.53
Jan. 20		211846 206871	64.43.51 64.12. 4	64.45.46 64.13.56	31.50	64.29.51
Jan. 21		209720 204825	64.30.25 63.58.39	64.32.16 64. 0.30	31.46	64.16.23
Mar. 1		128498 126090	52. 6.33 51.34.58	52. 7.40 51.36. 4	31.36	51.51.52
Mar. 2		126766 124378	51.43.54 51.12. 2	51.45. 0 51.13. 7	31.53	51.29. 3
Mar. 3		125042 122703	51.20.58 50.49.15	51.22. 3 50.50.19	31.44	51. 6.11
Mar. 4		123327 121030	50.57.47 50.26. 6	50.58.51 50.27. 9	31.42	50.43. 0
Mar. 5		121650 119370	50.34.43 50. 2.46	50.35.47 50. 3.39	32. 8	50.19.43
Mar. 6		120585 117749	50.19.53 49.39.36	50.20.56 49.40.38	40.18	
Mar. 8		116734 114565	49.24.54 48.53. 0	49.25.55 48.54. 0	31.55	49. 9.57
Mar. 9		115125 113017	49. 1.19 48.29.49	49. 2.19 48.30.48	31.31	48.46.34
Mar. 11		111995 109940	48.14.18 47.42.38	48.15.16 47.43.35	31.41	47.59.26

Mar.

1666		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Mar. 12	ex literis Maraldi	110468 108437	47.50.51 47.19. 5	47.51.48 47.20. 2	31.46	47.35.55
Mar. 13	ex iiſdem	108952 106954	47.27.11 46.55.28	47.28. 8 46.56.24	31.44	47.12.16
Mar. 16		104526 102610	46.16. 4 45.44.17	46.16.58 45.45.10	31.48	46. 1. 4
Mar. 17		103085 101224	45.52.13 45.20.55	45.53. 6 45.21.48	31.18	45.37.27
Mar. 18		101681 99835	45.28.39 44.57. 8	45.29.32 44.58. 0	31.32	45.13.46
Mar. 19		100317 98458	45. 5.26 44.33.18	45. 6.18 44.34. 9	32. 9	44.50.13
Mar. 24		93622 91916	43. 6.48 42.35.16	43. 7.37 42.36. 4	31.33	42.51.50
Mar. 25		92375 90665	42.43.49 42.11.51	42.44.37 42.18.38	31.59	42.28.37
Mar. 28		88640 87018	41.33.14 41. 1.45	41.34. 1 41. 2.31	31.30	41.18.16
Mar. 29		87425 85820	41. 9.42 40.38.11	41.10.28 40.38.56	31.32	40.54.42
Apr. 1		83918 82383	40. 0.10 39.28.58	40. 0.54 39.29.41	31.13	39.45.17
Apr. 3		81672 80158	39.14.21 38.42.54	39.15. 4 38.43.36	31.28	38.59.20
Apr. 4		80576 79066	38.51.37 38.19.55	38.52.19 38.20.36	31.43	38.36.27
Apr. 5		79492 78004	38.28.55 37.57.20	38.29.37 37.58. 1	31.36	38.13.49

1666		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Apr. 6	Nulla huic diei adſcripta eſt obſervatio in Maraldi literis; ſed hæc nota adjecta: *obſervatio convenit cum calculo*. Nimirum per hoſce dies Caſſinus tangentes limborum Solis e ſuis tabulis ſupputabat antequam ad obſervationem accederet, ut tabularum conſenſum cum Cœlo adverſus nonnullos demonſtraret; de quo extat Caſſini epiſtola ad Montanarium ad calcem ephemeridis ab hoc editæ anno 1666					
Apr. 7	Ex iiſdem literis.	77361 75907	37.43.33 37.12. 4	37.44.13 37.12.53	31.20	37.28.33
Jun. 19		38913 37878	21.15.45 20.44.44	21.16. 4 20.45. 3	31. 1	21. 0.33
Sept. 17		92034 90354	42.37.29 42. 5.57	42.38.17 42. 6.44	31.33	42.22.30
Sept. 20		95857 94114	43.47.17 43.15.48	43.48. 7 43.16.37	31.30	43.32.22
Oct. 14		133000 130500	53. 3.40 52.32.15	53. 4.50 52.33.23	31.27	52.49. 7
Oct. 15		134835 132270	53.26.15 52.54.34	53.27.25 52.55.43	31.42	53.11.34
Dec. 18		249600 242970	68.10. 1 67.37.45	68.12.18 67.39.58	32.20	67.56. 8
Dec. 21		249997 243380	68.11.54 67.39.48	68.14.11 67.42. 2	32. 9	67.58. 6
Dec. 25	Mengol. in Anno pag. 22	249102 242602	68. 7.39 67.35.55	68. 9.56 67.38. 8	31.48	67.54. 2

Mar.

1667		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 31	ex literis Maraldi	85357 83780	40.28.59 39.57.23	40.29.44 39.58. 7	31.37	40.13.55
Apr. 1	ex iiſdem literis	84197 82650	40. 5.47 39.34.26	40. 6.31 39.35. 9	31.22	39.50.50
Apr. 4		80840 79327	38.57. 7 38.25.26	38.57.50 38.26. 8	31.42	38.41.59
Apr. 12		72573 71185	35.58.11 35.26.42	35.58.47 35.27.18	31.29	35.43. 2
Apr. 13		71612 70235	35.36.26 35. 4.56	35.37. 2 35. 5.31	31.31	35.21.16
Apr. 14		70676 69300	35.15. 4 34.43.20	35.15.39 34.43.55	31.44	34.59.47
Apr. 16		68802 67485	34.31.43 34. 0.49	34.32.18 34. 1.24	30.54	34.16.51
Apr. 28		58946 57740	30.31. 3 30. 0. 8	30.31.32 30. 0.37	30.55	30.16. 5
Apr. 29		58212 57025	30.12.17 29.41.38	30.12.46 29.42. 6	30.40	29.57.26
Maj. 1		56782 55610	29.35.20 29. 4.43	29.35.48 29. 5.11	30.37	29.20.29
Maj. 8		52263 51113	27.35.34 27. 4.23	27.36. 0 27. 4.49	31.11	27.20.24
Maj. 10		51090 49950	27. 3.45 26.32.32	27. 4.11 26.32.58	31.13	26.48.34
Maj. 13		49399 48318	26.17.20 25.47.20	26.17.46 25.47.44	30. 2	26. 2.45
Maj. 18		46892 45826	25. 7.22 24.37.12	25. 7.45 24.37.34	30.11	24.52.39
Maj. 20		45993 44937	24.41.57 24.11.51	24.42.19 24.12.13	30. 6	24.27.16

Apr.

1667		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Maj. 22	ex literis Maraldi	45150 44076	24.17.57 23.47. 9	24.18.19 23.47.30	30.49	24. 2.54
Maj. 23	ex iiſdem literis	44752 43654	24. 6.34 23.35. 0	24. 6.56 23.35.21	31.35	23.51. 8
Maj. 24		44337 43289	23.54.39 23.24.26	23.55. 0 23.24.47	30.13	23.39.53
Maj. 25		43990 42912	23.44.41 23.13.31	23.45. 2 23.13.52	31.10	23.29.27
Maj. 27		43153 42195	23.20.30 22.52.39	23.20.51 22.52.59	27.52	
Maj. 28		42922 41854	23.13.48 22.42.41	23.14. 9 22.43. 1	31. 8	22.58.35
Maj. 29		42595 41530	23. 4.18 22.33.11	23. 4.39 22.33.31	31. 8	22.49. 5
Maj. 31		41987 40938	22.46.34 22.15.48	22.46.54 22.16. 8	30.46	22.31.31
Jun. 1		41703 40652	22.38.16 22. 7.21	22.38.36 22. 7.41	30.55	22.23. 9
Jun. 2		41440 40375	22.30.34 21.59.11	22.30.54 21.59.31	31.23	22.15.12
Jun. 3		41146 40132	22.21.55 21.52. 0	22.22.15 21.52.20	29.55	22. 7.18
Jun. 4		40935 39889	22.15.42 21.44.48	22.16. 2 21.45. 7	30.55	22. 0.35
Jun. 5		40704 39653	22. 8.55 21.37.48	22. 9.15 21.38. 7	31. 8	21.53.41
Jun. 6		40489 39441	22. 2.34 21.31.29	22. 2.54 21.31.48	31. 6	21.47.21
Jun. 7		40293 39230	21.56.46 21.25.12	21.57. 6 21.25.31	31.35	21.41.19

1667		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ' ''	G ' ''	' ''	G ' ''
Jun.9	ex iiſdem literis	39922 38884	21.45.46 21.14.53	21.46. 5 21.15.12	30.53	21.30.38
Jun.10		39765 38713	21.41. 7 21. 9.46	21.41.26 21.10. 5	31.21	21.25.45
Jun.11		39612 38571	21.36.35 21. 5.32	21.36.53 21. 5.51	31. 2	21.21.22
Jun.14		39248 38210	21.25.44 20.54.42	21.26. 3 20.55. 1	31. 2	20.10.32
Jun.16		39085 38050	21.20.53 20.49.55	21.21.12 20.50.14	30.58	21. 5.43
Jun.17		39015 37980	21.18.48 20.47.49	21.19. 7 20.48. 8	30.59	21. 3.37
Jun.18		38965 37930	21.17.18 20.46.18	21.17.37 20.46.37	31. 0	21. 2. 7
Jun.21	Mezzavacca ephem. tomo p. pag. 70. Mengol. de refract. p. 19. cum quibus conſentiunt ſchedæ M. S. S. Auguſtini Fabrii. In literis autem Maraldi conſignatur tangens limbi inferioris 38908; de limbo ſuperiori cum illis convenit	38907 37872	21.15.34 20.44.34	21.15.53 20.44.53	31. 0	21. 0.23
Jun.22	Mengolus eodem loco, & M.S. S. Fabrii. Literæ Maraldi conſentiunt de limbo ſuperiore, inferioris vero tangentem exhibent 38905	38915 37868	21.15.49 20.44.27	21.16. 8 20.44.46	31.22	21. 0.27
Jun.23	Ex literis Maraldi.	38925 37890	21.16. 7 20.45. 5	21.16.26 20.45.24	31. 2	21. 0.55
Jun.26	Ex iiſdem literis.	39065 38030	21.20.18 20.49.18	21.20.37 20.49.37	31. 0	21. 5. 7

Dec.

1667		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 15	Mengol. in Anno pag. 22	248075 241550	68. 2.44 67.30.39	68. 5. 0 67.32.52	32. 8	67.48.56
Dec. 16	Mengol. eodem loco	248613 242072	68. 5.18 67.33.16	68. 7.34 67.35.29	32. 5	67.51.32
Dec. 22	Mengol. de refractionibus pag. 19	249976 243400	68.11.48 67.39.53	68.14. 5 67.42. 7	31.58	67.58. 6
1668						
Apr. 14	ex MSS. Auguſt. Fabrii	69950 68600	34.58.22 34.27. 0	34.58.57 34.27.35	31.22	34.43.16
Apr. 15	ex iiſdem M. S. S.	69036 67704	34.37.11 34. 5.59	34.37.46 34. 6.34	31.12	34.22.10
Apr. 17	ex iiſdem	67235 65930	33.54.54 33.23.49	33.55.29 33.24.23	31. 6	33.39.56
Apr. 19	ex iiſdem	65500 64210	33.13.29 32.42.16	33.14. 2 32.42.48	31.14	32.58.25
Apr. 20	ex iiſdem	64640 63378	32.52.43 32.21.57	32.53.15 32.22.29	30.46	32.37.52
Apr. 21	ex iiſdem	63810 62545	32.32.31 32. 1.25	32.33. 3 32. 1.57	31. 6	32.17.30
Apr. 22	ex iiſdem	62990 61740	32.12.24 31.41.28	32.12.56 31.41.59	30.57	31.57.27
Apr. 30	ex iiſdem	56960 55775	29 39.57 29. 9. 2	29.40.27 29. 9.31	30.56	29.24.59
Maj. 1	ex iiſdem M. S.S. *ſubnubilum . utcumque*	56250 55090	29.21.29 28.51. 2	29.21.57 28.51.30	30.27	29. 6.44
Maj. 3	ex iiſdem	54920 53760	28.46.32 28.15.45	28.47. 0 28.16.12	30.48	28.31.36
Maj. 6		53016 51868	27.55.50 27.24.54	27.56.17 27.25.20	30.57	27.40.48

1668		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 7	ex MSS. Fabrii	52410 51272	27.39.32 27. 8.42	27.39.58 27. 9. 8	30.50	27.24.33
Maj. 8	Hanc obſervationem conſignat Fabrius die 9. Sed reliquarum progreſſus oſtendit pertinere ad diem 8	51830 50696	27.23.52 26.53. 0	27.24.18 26.53.26	30.52	27. 8.52
Maj. 11		50080 48975	26.36. 6 26. 5.37	26.36.31 26. 6. 1	30.30	26.21.16
Maj. 12		49530 48464	26.20.57 25.51.23	26.21.22 25.51.47	29.35	26. 6.35
Maj. 13	Extant hujus diei tangentes in M. S. S. Fabrii 47050, & 47850 (vel 45850) quæ a penumbra correctæ ſunt 47000, & 45900, ſed nulla ratione cum ſequentibus ac præcedentibus conciliari poſſunt. Suſpicio eſſet eas ad diem 17 ſpectare, niſi paullo infra haberetur ejus diei obſervatio nonnihil ab hac diſcrepans					
Maj. 15		47990 46830	25.38.10 25. 7.19	25.38.33 25. 7.42	30.51	25.23. 7
Maj. 17		47006 45892	25.10.35 24.39. 5	25.10.58 24.39.28	31.30	24.55.13
Maj. 19		46103 45020	24.45. 3 24.14.14	24.45.26 24.14.36	30.50	24.30. 1
Maj. 20		45676 44600	24.32.57 24. 2.12	24.33.17 24. 2.34	30.43	24.17.56
Maj. 21		45250 44183	24.20.48 23.50.14	24.21.10 23.50.36	30.34	24. 5.53

Maj.

1668		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ' "	*Diſt. a vertice vera limborum* G ' "	*Diam. app. Solis* ' "	*Diſt. a vertice vera centri* G ' "
Maj. 22	ex MSS. Fabrii	44840 43770	24. 9. 5 23.38.21	24. 9.27 23.38.43	30.44	23.54. 5
Maj. 24		44060 43000	23.46.41 23.16. 4	23.47. 3 23.16.25	30.38	23.31.44
Maj. 25		43695 42640	23.36.10 23. 5.36	23.36.31 23. 5.58	30.34	23.21.14
Maj. 26		43280 42250	23.24.11 22.54.14	23.24.32 22.54.35	29.57	23. 9.33
Maj. 27		42995 41945	23.15.55 22.45.21	23.16.16 22.45.42	30.34	23. 0.59
Maj. 31		41770 40716	22.40.12 22. 9.16	22.40.33 22. 9.36	30.57	22.25. 4
Jun. 2		41230 40195	22.24.23 21.53.51	22.24.43 21.54.11	30.32	22. 9.27
Jun. 10		39615 38610	21.36.40 21. 6.42	21.37. 0 21. 7. 1	29.59	21.22. 0
Jun. 11		39492 38484	21.33. 0 21. 2.55	21.33.19 21. 3.14	30. 5	21.18.16
Jun. 12		39380 38395	21.29.41 21. 0.16	21.30. 0 21. 0.35	29.25	21.15.18
Jun. 13	ex iiſdem. Mengolus vero in Anno pag. 16 limbi ſuperioris tangentem 5 particulis minorem facit	39270 38250	21.26.24 20.55.55	21.26.43 20.56.14	30.29	21.11.29
Jun. 14	ex iiſdem. Conſentit Mengolus eodem loco	39180 38145	21.23.42 20.52.45	21.24. 1 20.53. 4	30.57	21. 8.32
Jn. 15	ex iiſdem. Mengolus eodem loco limbi ſup. tangentem particulis 10 breviorem conſignat	39100 38072	21.21.20 20.50.35	21.21.39 20.50.54	30.45	21. 6.16

Jun.

1668		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun.16	ex iiſdem, & conſentit Mengolus ib. pag. 15	39040 37998	21.19.33 20.48.21	21.19.52 20.48.40	31.12	21. 4.16
Jun.17	ex iiſdem. Conſentit Mengol. ibidem	38985 37948	21.17.55 20.46.51	21.18.14 20.47.10	31. 4	21. 2.42
Jun.18	ex iiſdem M. S. S.	38940 37905	21.16.34 20.45.33	21.16.53 20.45.52	31. 1	21. 1.22
Jun.20	ex iiſdem. Sed Mengolus de refract. pag. 19 majorem tangentem mulctat particulis duabus	38902 37872	21.15.25 20.44.34	21.15.44 20.44.53	30.51	21. 0.18
Jun.21	ex iiſdem, & conſentit Mengolus ib. Sed Mezzavacca ephem. tomo p. pag. 70 majorem tangentem auget part. 9	38908 37860	21.15.36 20.44.12	21.15.55 20.44.31	31.24	21. 0.13
Jun.22	ex iiſdem, conſentiente Mengol. ib.	38910 37885	21.15.40 20.44.56	21.15.59 20.45.15	30.44	21. 0.37
Jun.23	ex iiſdem	38943 37900	21.16.39 20.45.24	21.16.58 20.45.43	31.15	21. 1.20
Jun.26		39105 38090	21.21.29 20.51. 7	21.21.48 20.51.26	30.22	21. 6.37
Jun.27		39200 38170	21.24.18 20.53.31	21.24.37 20.53.50	30.47	21. 9.13
Jun.28		39300 38270	21.27.18 20.56.31	21.27.37 20.56.50	30.47	21.12.13
Jun.30		39545 38495	21.24.35 21. 3.15	21.34.54 21. 3.34	31.20	21.19.14
Jul.1		39675 38640	21.28.26 21. 7.35	21.28.45 21. 7.54	30.51	21.23.19

1668		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jul. 3	ex iiſdem	40000 38960	21.48. 5 21.17. 9	21.48.25 21.17.28	30.57	21.32.56
Jul. 5		40370 39330	21.59. 2 21.28.11	21.59.22 21.28.30	30.52	21.43.56
Jul. 10		41550 40510	22.33.46 22. 3.11	22.34. 6 22. 3.31	30.35	22.18.48
Sept. 14		89000 87364	41.40. 9 41. 8.32	41.40.56 41. 9.18	31.38	41.25. 7
Sept. 15		90205 88542	42. 3. 7 41.31.21	42. 3.54 41.32. 7	31.47	41.48. 0
Sept. 20		96542 94800	43.59.32 43.28.15	44. 0.23 43.29. 5	31.18	43.44.44
Sept. 21		97876 96100	44.23. 6 43.51.39	44.23.57 43.52.29	31.28	44. 8.13
Sept. 22		99223 97416	44.46.35 44.15. 0	44.47.26 44.15.51	31.35	44.31.38
Sept. 23		100590 98760	45.10. 7 44.38.33	45.10.59 44.39.24	31.35	44.55.11
Sept. 24		101967 100120	45.33.28 45. 2. 4	45.34.21 45. 2.56	31.25	45.18.38
Sept. 29		109190 107195	47.30.55 46.59.20	47.31.52 47. 0.16	31.36	47.16. 4
Sept. 30		110700 108680	47.54.26 47.22.55	47.55.24 47.23.52	31.32	47.39.38
Oct. 2		113766 111685	48.41. 4 48. 9.34	48.42. 3 48.10.32	31.31	48.26.17

1668		Tangentes correctæ ape numbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Dec. 12	Mengolus in anno pag. 22. Ex MSS. vero Fabrii ad diem 11 Decembris deducuntur tangentes correctæ a penumbra 246470, & 239988, quæ ut apparet, quam minimum ab his diſcrepant quas Mengolus die 12 conſignat, exhibentque diſtantiam centri Solis a vertice prorſus eandem. Liquet ergo utramque obſervationem ad eundem diem ſpectare, huncque non alium eſſe quam diem 12 oſtendit Solis longitudo, quæ prodit gr. 21 $\frac{1}{3}$ ♐	246473 239984	67.54.59 67.22.44	67.57.14 67.24.56	32.18	67.41. 5
Dec. 19	Mengol. de refract. pag. 19 & ſeq. & in Anno pag. 24. In ſchedis vero Fabrii conſignatur tangens limbi inferioris 249974 (quæ correcta eſt 249924) cum adjecta nota. *Vide nam pro* 74 *erat* 64; quæ correctio cum Mengoli numeris convenit	249914 243284	68.11.31 67.39.19	68.13.48 67.41.33	32.15	67.57.41
Dec. 20	Mengolus iiſdem locis. Conſentiunt MSS. Fabrii	250000 243365	68.11.55 67.39.44	68.14.12 67.41.58	32.14	67.58. 5
Dec. 21	Mengolus iiſdem locis. Conſentiunt MSS. Fabrii, & literæ Maraldi, quæ nomen obſervatoris ſubdunt *Auguſtinus Fabri*	250000 243400	68.11.55 67.39.53	68.14.12 67.42. 7	32. 5	67.58. 9
Dec. 22	Mengolus iiſdem locis	249914 243284	68.11.30 67.39.19	68.13.47 67.41.33	32.14	67.57.40

Dec.

1668		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Dec. 23	ex MSS. Fabrii	249702 243105	68.10.30 67.38.26	68.12.47 67.40.39	32. 8	67.56.43
Dec. 24	ex MSS. Fabrii. Mengolus autem in anno pag. 22 tangentem limbi inferioris correctam a penumbra facit 249177, ex qua prodit Solis diameter debito minor; itaque Fabrii numeri veriores videntur	249440 242808	68. 9.15 67.46.57	68.11.32 67.39.10	32.22	67.55.21
Dec. 25	Mengolus in Anno pag. 22, & de refract. pag. 63	249015 242400	68. 7.14 67.34.55	68. 9.31 67.37. 8	32.23	67.53.19
Dec. 27	Mengolus in Anno pag. 22	247914 241400	68. 1.57 67 29.54	68. 4.13 67.32. 6	32. 7	67.48.10
Dec. 28	Mengolus eodem loco	247212 240744	67.58.34 67.26.35	68. 0.50 67.28.47	32. 3	67.44 49
Dec. 30	Mengolus eodem loco, conſentientibus MSS. Fabrii	245610 239170	67.50.46 67.18.34	67.53. 1 67.20.45	32.16	67.36.53
1669						
Jan. 2	Ex MSS. Fabrii *Sole nebuloſo*. In hiſce MSS. extant præterea per hos dies comparationes obſervationum cum locis Solis ex Caſſinianis tabulis; & interdum quidem ex tangentibus obſervatis locum Solis ſupputat, & cum Caſſiniana longitudine confert, interdum ex Caſſiniana longitudine tangentes computat, eaſque cum obſervatis tangentibus comparat, atque ut plurimum conſentire repe-	242493 236185	67.35.24 67. 3. 8	67.37.37 67. 5.17	32.20	67.21.27

1669		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ' "	Diſt. a vertice vera limborum G ' "	Diam. app. Solis ' "	Diſt. a vertice vera centri G ' "
	rit, ut hac ipſa die 2 Januarii prodeunt illi ex tabulis tangentes incorrectæ 242535, & 236156, quæ parum abſunt ab obſervatis, nec correctis 242543, & 236135. Utitur porro in hiſce computis obliquitate eccliptica gr. 23. 29 0, latitudine Bononiæ gr. 44 29.5, & parallaxibus Solis, ac refractionibus Caſſinianis antiquioribus, quæ nempe cum Malvaſiæ, & Mezzavacchii ephemeridibus vulgatæ ſunt pro æſtivis, æquinoctialibus, atque hybernis temporibus diverſæ					
Jan. 10	Ex iiſdem Fabrii MSS. *Sole Claro tremulo.* Hodie tangentes ex computo correctæ a penumbra 230810, 225044	230810 225011	66.34.30 66. 2.19	66.36.36 66. 4.22	32.14	66.20.29
Jan. 12	Ex iiſdem *Sole Claro*. Tangentes ex computo correctæ 227228, & 221601.	227260 221594	66.14.58 65.42.41	66.17. 2 65.44.42	32.20	66. 0.52
Jan. 14	Ex iiſdem. Tang. correctæ ex computo 223508, 218033	223485 217983	65.53.37 65.21.24	65.55.39 65.23.23	32.16	65.39.31
Feb. 2	Ex iiſdem. Tang. ex computo correctæ 182639, 178703	182668 178720	61.18. 7 60.46.17	61.19.46 60.47.54	31.52	61. 3.50
Feb. 10	Ex iiſdem. Tang. ex computo 165119, 161733 correctæ	165142 161753	58.48.12 58.16.29	58.49.41 58.17.56	31.45	58.33.48
Feb. 16	Ex iiſdem *Sole Claro*. Subdit Fabrius *obſervatio calculo præciſe concordat*	152648 149615	56.46.16 56.14.31	56.47.37 56.15.51	31.46	56.31.44

1669		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 21	Ex literis Maraldi, conſentientibus MSS. Fabrii, ubi tangentes correctæ ex computo 97204, 95431	97204 95432	44.11.16 43.39.40	44.12. 7 43.40.30	31.37	43.56.18
Mar. 27	Ex MSS. Fabrii, ubi eaſdem omnino ex computo reperit	89509 87867	41.49.53 41.18.17	41.50.40 41.19. 4	31.36	41.34.52
Mar. 29	Ex iiſdem, ubi ſubdit *obſervatio, & calculus*	87098 85504	41. 3.19 40.31.54	41. 4. 5 40.32.39	31.26	40.48.22
Mar. 30	Ex iiſdem, nec conſtat computo an obſervatione inventæ ſint	85915 84342	40.40. 4 40. 8.42	40.40.49 40. 9.22	31.27	40.25. 5
Mar. 31	Ex iiſdem, ubi ex computo corr. 84760, 83194	84752 83202	40.16.55 39.45.40	40.17.40 39.46.24	31.16	40. 2. 2
Apr. 8	ex iiſdem MSS.	76042 74603	37.15. 0 36.43.27	37.15.39 36.44. 5	31.34	36 59.52
Maj. 18		46685 45568	25. 1.32 24.29.51	25. 1.55 24.30.13	31.42	24.46. 4
Maj. 19	*Cælo obſcuro*	46218 45135	24.48.20 24.17.31	24.48.43 24.17.53	30.50	24.33.18
Maj. 23		44542 43466	24. 0.33 23.29.34	24. 0.55 23.29.55	31. 0	23.45.25
Maj. 25		43780 42717	23.38.38 23. 7.51	23.39. 0 23. 8.11	30.49	23.23.36
Jun. 14		39205 38170	21.24.27 20.53.31	21.24.46 20.53.50	30.56	21. 9.18
Jun. 18		38942 37912	21.16.37 20.45.45	21.16.56 20.46. 4	30.52	21. 1.30
Jun. 19		38915 37898	21.15.49 20.45.20	21.16. 8 20.45.39	30.29	21. 0.54

1669		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jun. 20	Ex iiſdem MSS. ſed Mengol. de refract. pag. 19 tangentes exhibet 38904, & 37860	38900 37874	21.15.22 20.44.37	21.15.41 20.44.56	30.45	21. 0.19
Jun. 21	Ex MSS. Fabrii. Mengol. autem prædicto loco habet 38900, & 37864	38900 37874	21.15.22 20.44.37	21.15.41 20.44.56	30.45	21. 0.19
Jun. 22	ex iiſdem MSS.	38905 37880	21.15.31 20.44.48	21.15.50 20.45. 7	30.43	21. 0.29
Dec. 12	Ex iiſdem. Conſentit Mengol. in anno pag. 22	246280 239818	67.54. 3 67.21.53	67.56.18 67.24. 5	32.13	67.40.11
Dec. 13	Ex iiſdem *dubia*. At Meng. eodem loco habet 247004, & 240594	247000 240595	67.57.32 67.25.50	67.59.47 67.28. 2	31.45	67.43.55
Dec. 14	Mengolus eodem loco. Fabrius autem in MSS. habet 247857, & 241491, ubi *dubiam* vocat obſervationem	247757 241291	68. 1.12 67.29.21	68. 3.28 67.31.34	31.54	67.47.31
Dec. 19	Ex literis Maraldi, conſentientibus Fabrii MSS.	249875 243245	68.11.19 67.39. 7	68.13.36 67.41.21	32.15	67.57.28
Dec. 22	Ex literis Maraldi, & ſchedis Fabrii	249950 243338	68.11.41 67.39.35	68.13.58 67.41.49	32. 9	67.57.53
Dec. 24	Ex literis Maraldi. Fabrius in ſchedis habet 249481, 242875. Mengolus vero loco prædicto 249440, 242855	249484 242875	68. 9.28 67.37.17	68.11.45 67.39.30	32.15	67.55.37
Dec. 26	Ex literis Maraldi. Schedæ autem Fabrii, & Mengolus tangentem utramque una particula minorem faciunt	248627 242072	68. 5.22 67.33.16	68. 7.38 67.35.29	32. 9	67.51.33

1669		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 28	Ex MSS. Fabrii. Conſentit Mengolus eodem loco	247390 240920	67.59.26 67.27.28	68. 1.42 67.29.40	32. 2	67.45.41
Dec. 29	Conſentiunt Mengolus, ſchedæ Fabrii, & Maraldi literæ	246660 240200	67.55.54 67.23.49	67.58. 9 67.26. 1	32. 8	67.42. 5
1670						
Jan. 4	Ex literis Maraldi, & MSS. Fabrii	240266 234118	67.24.10 66.52.15	67.26.22 66.54.23	31.59	67.10.23
Jan. 17	Ex iiſdem utriſque	218030 212788	65.21.41 64.49.44	65.23.40 64.51.40	32. 0	65. 7.40
Jan. 18		215966 210800	65. 9.15 64.37.16	65.11.13 64.39.11	32. 2	64.55.12
Jan. 23		205347 200608	64. 2. 6 63.30.16	64. 3.57 63.32. 5	31.52	63.48. 1
Jan. 25	Ex MSS. Fabrii	200970 196400	63.32.44 63. 0.59	63.34.33 63. 2.45	31.48	63.18.39
Feb. 6	Ex literis Maraldi. Hanc obſervationem notat Fabrius ad diem 7; verum longitudo Solis, quæ prodit ≈ 18. 4 procul dubio diem 6 indicat	174332 170750	60. 9.38 59.38.30	60.11.13 59.40. 3	31.10	59.55.38
Feb. 24	Maraldi literæ, & Fabrius	137507 134890	53.58.26 53.26.56	53.59.38 53.28. 6	31.32	53.43.52
Feb. 25	ex iiſdem	135655 133050	53.36.13 53. 4.18	53.37.24 53. 5.28	31.56	53.21.26
Feb. 26	ex iiſdem	133770 131270	53.13.12 52.42. 1	53.14.22 52.43.10	31.12	52.58.46

Mar.

1670		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Mar. 4	Ex MSS. Fabrii. De limbo ſuperiore conſentiunt Maraldi literæ, ſed inferioris tangentem faciunt 123868, mendoſe, ut videtur	123868 120985	50.56.58 50.25.28	50.58. 2 50.26.31	31.31	50.42.16
Mar. 8	Maraldi literæ, & Fabrius	116680 114526	49.24. 8 48.52.25	49.25. 9 48.53.25	31.44	49. 9.17
Mar. 10	ex iiſdem	113518 111410	48.37.21 48. 5.21	48.38.20 48. 6.19	32. 1	48.22.19
Mar. 13	ex iiſdem	108913 106920	47.26.35 46.54.56	47.27.32 46.55.52	31.40	47.11.42
Mar. 14	ex iiſdem	107420 105446	47. 2.55 46.31. 7	47. 3.51 46.32. 2	31.49	46.47.56
Mar. 15	ex literis Maraldi. Mezzavacca ephem. tomo p. pag. 46 habet 106000, & 104000	105950 103998	46.39.17 46. 7.22	46.40.12 46. 8.16	31.56	46.24.14
Mar. 19	Maraldi literæ, & Fabrius	100270 98450	45. 4.38 44.33. 9	45. 5.30 44.34. 0	31.30	44.49.45
Apr. 5	ex iiſdem	79448 77965	38.28. 0 37.56.31	38.28.42 37.57.12	31.30	38.12.57
Apr. 18	ex iiſdem	66805 65477	33.44.41 33.12.55	33.45.15 33.13.28	31.47	33.29.21
Apr. 19	ex iiſdem	65913 64617	33.23.24 32.52.10	33.23.58 32.52.43	31.15	33. 8.20
Apr. 25	ex iiſdem	60991 59760	31.22.46 30.51.45	31.23.17 30.52.15	31. 2	31. 7.46
Apr. 29	ex ſchedis Fabrii	58005 56820	30. 6.57 29.36.19	30. 7.26 29.36.47	30.39	29.52. 7
Apr. 30	Maraldi literæ, & Fabrius	57295 56113	29.48.38 29.17.54	29.49. 6 29.18.22	30.44	29.33.44

Maj.

1670		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Maj. 1	ex iiſdem	56521 55413	29.28.32 28.59.32	29.29. 0 29. 0. 0	29. 0	29.14.30
Maj. 2		55922 54746	29.12.54 28.41.57	29.13.22 28.42.25	30.57	28.57.53
Maj. 5		53950 52776	28.20.49 27.49.24	28.21.16 27.49.50	31.26	28. 5.33
Maj. 6		53320 52148	28. 4. 0 27.32.28	28. 4.27 27.32.54	31.33	27.48.40
Maj. 7		52702 51550	27.47.24 27.16.16	27.47.50 27.16.42	31. 8	27.32.16
Maj. 13		49266 48158	26.13.40 25.42.52	26.14. 4 25.43.16	30.48	25.58.40
Maj. 14	ex MSS. Fabrii *obſcuro Sole*	48748 47638	25.59.18 25.28.20	25.59.42 25.28.43	30.59	25.44.12
Maj. 15	ex MSS. Fabrii. Conſentit Maraldus, ſed dubiam obſervationem arbitratur, atque adeo litura eam induxerat	48231 47138	25.44.55 25.14.17	25.45.19 25.14.40	30.39	25.30. 0
Maj. 16	Maraldi literæ, & Fabrius	47738 46645	25.31. 8 25. 0.24	25.31.31 25. 0.47	30.44	25.16. 9
Maj. 22	ex iiſdem	45024 43963	24.14.21 23.43.55	24.14.43 23.44.17	30.26	23.59.30
Jun. 13	Mengolus in anno pag. 7	39320 38297	21.27.53 20.57.19	21.28.12 20.57.38	30.34	21.12.55
Jun. 14	Mengolus ibidem. Maraldus vero, & Fabrius minorem tangentem correctam faciunt 38138, ſed Mengoli numeros Solis diameter comprobare videtur	39227 38188	21.25. 7 20.54. 4	25.25.26 20.54.23	31. 3	21. 9.55

Jun.

1670		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 15	Conſentiunt Maraldus, Fabrius, Mengolus	39130 38107	21.22.14 20.51.37	21.22.33 20.51.56	30.37	21. 7.14
Jun. 16	Maraldus, Fabrius, Mengolus	39060 38030	21.20. 9 20.49.18	21.20.28 20.49.37	30.51	21. 5. 2
Jun. 18	Mengolus ib. Maraldi vero literæ, & Fabrii MSS. habent pro tangente limbi ſuperioris correcta 37963, unde breviuſcula elicitur Solis diameter	38950 37913	21.16.51 20.45.47	21.17.10 20.46. 6	31. 4	21. 1.38
Jun. 19	Maraldus, Fabrius, Mengolus. Addit Fabrius *inter nubes*	38920 37872	21.15.58 20.44.34	21.16.17 20.44.53	31.24	21. 0.35
Jun. 20	Maraldus, Fabrius, Mengolus	38910 37863	21.15.40 20.44.18	21.15.59 20.44.37	31.22	21. 0.18
Jun. 21	ex iiſdem	38910 37863	21.15.40 20.44.18	21.15.59 20.44.37	31.22	21. 0.18
Jun. 22	Mengolus ib. Conſentiunt ſchedæ Fabrii, verum obſervatio tranſverſo ſigno inducta erat	38890 37882	21.15. 4 20.44.51	21.15.23 20.45.10	30.13	21. 0.17
Jun. 24	Maraldus, Mengolus, Fabrius	38970 37930	21.17.27 20.46.18	21.17.46 20.46.37	31. 9	21. 2.11
Jun. 25	ex iiſdem	39013 37973	21.18.44 20.47.36	21.19. 3 20.47.55	31. 8	21. 3.29
Jun. 28	Mengolus in anno pag. 7	39241 38200	21.25.32 20.54.25	21.25.52 20.54.44	31. 8	21.10.18
Jul. 10	ex MSS. Fabrii	41410 40383	22.29.41 21.59.25	22.30. 1 21.59.45	30.16	22.14.53
Jul. 13	ex iiſdem	42270 41210	22.54.49 22.23.48	22.55.10 22.24. 8	31. 2	22.39.39

1670		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jul. 14	ex iiſdem MSS., quæ poſtrema in iis eſt obſervatio	42580 41510	23. 3.51 22.32.35	23. 4.12 22.32.55	31.17	22.48.33
Sept. 10	ex Maraldi literis	83730 82202	39.56.22 39.25.15	39.57. 6 39.25.58	31. 8	39.41.32
Sept. 11	ex iiſdem	84877 83338	40.19.25 39.48.26	40.20.10 39.49.10	31. 0	40. 4.40
Sept. 14		88407 86820	41.28.44 40.57.52	41.29.31 40.58.48	30.43	41.14.10
Sept. 15		89613 87991	41.51.52 41.20.42	41.52.39 41.21.29	31.10	41.37. 4
Sept. 17		92088 90412	42.38.29 42. 7. 2	42.39.17 42. 7.49	31.28	42.23.33
Sept. 18		93336 91642	43. 1.33 42.30.10	43. 2.22 42.30.58	31.24	42.46.40
Sept. 19		94612 92880	43.24.51 42.53. 9	43.25.41 42.53.58	31.43	43. 9.50
Sept. 20		95897 94190	43.48. 0 43.17.11	43.48.50 43.18. 0	30.50	43.33.25
Sept. 21	ex iiſdem, ſed obſervatio minime cum aliis conſentit	97840 95992	44.22.28 43.49.43	44.23.19 43.50.33	32.46	44. 6.56
Sept. 22		98583 96788	44.35.28 44. 3.54	44.36.19 44. 4.45	31.34	44.20.32
Sept. 26		104128 102226	46. 9.31 45.37.50	46.10.25 45.38.43	31.42	45.54.34
Sept. 29		108476 106508	47.19.41 46.48. 8	47.20.48 46.49.14	31.34	47. 1. 1
Dec. 15	Mengol. in anno pag. 22	248243 241738	68. 3.32 67.31.36	68. 5.48 67.33.49	31.59	67.49.48
Dec. 31	Mengol. ibidem	245110 238710	67.48.20 67.16.13	67.50.35 67.18.24	32.11	67.34.29

1671		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 18	Montanarius, & ſocii. Ex ephemeride eruditorum hujus anni pag. 169. Eadem nocte tangentes Lunæ incorrectæ 102083. 100133	93020 91337	42.55.44 42.24.27	42.56.33 42.25.15	31.18	42.40.54
Sept. 19	ex eadem ephemeride	94297 92586	43.19. 8 42.47.43	43.19.58 42.48.32	31.26	43. 4.15
Oct. 4	ex MSS. Montanarii. Conſentiunt literæ Maraldi, monentque hanc, & ſequentes obſervationes ab ipſo Montanario (aut forte a ſociis) fuiſſe habitas, uſque ad diem 23 Septembris 1672, quæ ultima eſt in hiſce literis obſervatio	115764 113635	49.10.43 48.39. 7	49.11.43 48.40. 6	31.37	48.55.54
Oct. 18	ex MSS. Montanarii. In Maraldi autem literis tangens minor correcta eſt 135304 mendoſe, ut videtur	140014 137304	54.27.54 53.56. 2	54.29. 7 53.57.13	31.54	54.13.10
Oct. 20	ex MSS. Montanarii, & Maraldi literis	143820 141030	55.11.19 54.39.38	55.12.35 54.40.52	31.43	54.56.43
Nov. 20 *	ex MSS. Montanarii, & Maraldi literis, in his adjectus eſt obſervationi aſteriſcus, quæ Maraldo nota eſt obſervationum minus certarum ob nebulas, aut aliis de cauſſis, itaque & nos deinceps eam notam, ubi ille appoſuit, adſcripſimus	209918 205006	64.31.41 63.59.50	64.33.35 64. 1.41	31.54	64.17.38

Dec.

1671		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 12	ex iiſdem utriſque. Maraldi tamen literæ tangentem limbi ſuperioris 3 particulis majorem faciunt, quod nihil turbat	245860 239422	67.52. 0 67.19.52	67.54.15 67.22. 3	32.12	67.38. 9
Dec. 13 *	ex iiſdem utriſque	246695 240225	67.56. 4 67.23.57	67.58.19 67.26. 9	32.10	67.42.14
Dec. 18	In MSS. Mont. tang. incorrectæ 249544, 242863, ſed hanc poſteriorem perperam corrigit, ſcribens 242883, cum debeat eſſe correcta 242913; deinde computum abſolvit, ac tranſverſo calamo delet. Poſt pauca tangentes iterum cõſignat incorrectas nulla diei mentione 249544, 242863, eaſq. corrigit 249544, 242913, & rurſum tranſverſo ſigno inducit, nempe quod iterum lapſus eſſet omittens ſubtractionem part. 50 ex majori. In literis vero Maraldi incorrectæ ſunt 249544, & 242833, atque ex his correctas elicui, & in ſeriem retuli	249494 242883	68. 9.31 67.37.19	68.11.48 67.39.32	32.16	67.55.40
1672						
Jan. 1	MSS. Montanarii, & Maraldi literæ	244367 237967	67.44.40 67.12.24	67.46.54 67.14.34	32.20	67.30.44
Jan. 2 *	ex iiſdem utriſque	243227 236991	67.39.32 67. 7.21	67.41.46 67. 9.31	32.15	67.25.38
Jan. 4	ex utriſque	240930 234673	67.27.31 66.55.12	67.29.43 66.57.21	32.22	67.13.32

S 2 Jan.

1672		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jan. 10	ex MSS. Montanarii	232048 226215	66.41.12 66. 9. 6	66.43.19 66.11. 9	32.10	66.27.14
Jan. 13	ex iiſdem, & ex Maraldi literis	226760 221090	66.12.10 65.39.45	66.14.14 65.41.46	32.28	65.58. 0
Jan. 18	ex utriſque	216971 211755	65.15.20 64.43.16	65.17.18 64.45.11	32. 7	65. 1.15
Jan. 20 *	ex literis Maraldi. Montanarii MSS. tangentem majorem 10 particulis augent, minorem totidem minuunt, itaque centri Solis locus fere idem prodit	212840 207740	64.50. 3 64.17.43	64.51.59 64.19.36	32.23	64.35.47
Feb. 11	Maraldi literæ, & Montanarius	164572 161188	58.42.56 58.11. 5	58.44.25 58.12.32	31.53	58.28.28
Feb. 21	Maraldi literæ	144150 141345	55.15. 1 54.43.16	55.16.17 54.44.30	31.47	55. 0.23
Feb. 24	Montanarius, & Maraldi literæ	138405 135750	54. 9. 4 53.37.22	54.10.16 53.38.33	31.43	53.54.24
Feb. 25	Montanarii MSS. In Maraldi literis limbus ſuperior deſideratur	136536 133875	53.46.51 53.14.30	53.48. 2 53.15.40	32.22	53.31.51
Feb. 27	Montan. MSS. & Maraldi literæ	132863 130360	53. 1.58 52.30.29	53. 3. 8 52.31.38	31.30	52.47.23
Mar. 3	ex literis Maraldi. In MSS. Montanarii habetur tangens limbi inferioris 124688 corr., quæ nimiam efficit Solis diametrum	124088 121775	51. 8. 7 50.36.27	51. 9.11 50.37.31	31.40	50.53.21
Mar. 6	ex MSS. Montanarii	119062 116874	49.58.23 49.26.55	49.59.26 49.27.56	31.30	49.43.41

Mar.

1672		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 13	ex literis Maraldi. Montanarius in MSS. tangentem majorem correctam conſignat 108124	108134 106150	47.14.17 46.42.32	47.15.13 46.43.27	31.46	46.59.20
Mar. 14	ex MSS. Montanarii. Conſentiunt Maraldi literæ	106642 104710	46.50.28 46.19. 5	46.51.24 46.20. 0	31.24	46.35.42
Mar. 15	Montanarii, & Maraldi literæ	105166 103265	46.26.32 45.55.13	46.27.27 45.56. 7	31.20	46.11.47
Mar. 16	ex iiſdem	103752 101820	46. 3.18 45.31. 0	46. 4.12 45.31.53	32.19	45.48. 2
Mar. 17		102320 100461	45.39.25 45. 7.54	45.40.18 45. 8.46	31.32	45.24.32
Mar. 19 *		99553 97730	44.52.18 44.20.32	44.53. 9 44.21.23	31.46	44.37.16
Mar. 26 *		90400 88770	42. 6.49 41.35.44	42. 7.36 41.36.31	31. 5	41.52. 3
Mar. 27		89178 87540	41.43.33 41.11.56	41.44.20 41.12.42	31.38	41.28.31
Mar. 28		87981 86358	41.20.30 40.48.48	41.21.17 40.49.34	31.43	41. 5.25
Apr. 1		83262 81767	39.46.53 39.16.19	39.47.37 39.17. 2	30.35	39.32.20
Apr. 2		82163 80644	39.24.27 38.53. 2	39.25.10 38.53.45	31.25	39. 9.27
Apr. 4	ex Maraldi literis. In MSS. Montanarii tangens limbi ſup. correcta eſt 78412, ex qua Solis diameter adhuc major colligeretur; itaque ut apparet, particularum 50 additionem omiſit	79972 78472	38.39. 0 38. 7.19	38.39.42 38. 8. 0	31.42	38.23.51

1672		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 5	ex MSS. Montanarii, & Maraldi literis	78881 77410	38.16. 0 37.44.37	38.16.41 37.45.17	31.24	38. 0.59
Apr. 6	ex Maraldi literis. Conſentit Mont. eſto in correctione limbi inf. duas particulas omiſerit	77822 76370	37.53.27 37.22. 8	37.54. 8 37.22.48	31.20	37.38.28
Apr. 7 *	ex MSS. Montanarii, & Maraldi literis	76790 75350	37.31.14 36.59.53	37.31.54 37. 0.32	31.22	37.16.13
Apr. 8 *		75745 74323	37. 8.31 36.37.15	37. 9.10 36.37.53	31.17	36.53.31
Apr. 9		74751 73320	36.46.43 36.14.56	36.47.21 36.15.33	31.48	36.31.27
Apr. 10 *		73752 72348	36.24.35 35.53. 5	36.25.13 35.53.42	31.31	36. 9.27
Apr. 11 *		72780 71383	36. 2.49 35.31.14	36. 3.26 35.31.50	31.36	35.47.38
Apr. 12 *		71810 70440	35.40.56 35. 9.39	35.41.32 35.10.14	31.18	35.25.53
Apr. 14		69930 68575	34.57.54 34.26.25	34.58.29 34.27. 0	31.29	34.42.45
Apr. 15		68997 67653	34.36.17 34. 4.46	34.36.52 34. 5.21	31.31	34.21. 6
Apr. 19		65466 64165	33.12.40 32.41.10	33.13.13 32.41.42	31.31	32.57.27
Apr. 20 *		64620 63325	32.52.14 32.20.38	32.52.47 32.21.10	31.37	32.36.58
Apr. 23	ex Maraldi literis. Sed MSS. Montan. habent 62175, 60885, quæ Solis ſpeciem nimis ampliant, centrum tamen parum mutant.	62165 60895	31.52. 1 31.20.21	31.52.32 31.20.52	31.40	31.36.42

Apr.

1672		Tangentes correctæ apenumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 24	ex Maraldi literis. Sed in MSS. Montan. 61396, 60115. Maraldi numeri Solis diametro propius reſpondent	61386 60125	31.32.39 31. 0.58	31.33.10 31. 1.28	31.42	31.17.19
Apr. 25	ex Maraldi literis, & Montanarii MSS.	60601 59350	31.12.58 30.41.21	31.13.28 30.41.50	31.38	30.57.39
Maj. 29	ex Maraldi literis. Montan. MSS. pro limbo infer. dant 42345 corr.	42349 41286	22.57. 7 22.26. 2	22.57.28 22.26.22	31. 6	2. 41.55
Jun. 12	ex MSS. Montanarii	39388 38346	21.29.56 20.58.48	21.30.15 20.59. 7	31. 8	21.14.41
Jun. 20	ex literis Maraldi. In MSS. Mont. limbus ſup. 37862	38902 37865	21.15.25 20.44.21	21.15.44 20.44.40	31. 4	21. 0.12
Jun. 21	Montanarius, & Maraldi literæ	38903 37865	21.15.27 20.44.21	21.15.46 20.44.40	31. 6	21. 0.13
Jun. 24	ex iiſdem	38996 37959	21.18.14 20.47.11	21.18.33 20.47.30	31. 3	21. 3. 1
Jun. 28	ex MSS. Montanarii	39305 38265	21.27.26 20.56.22	21.27.45 20.56.41	31. 4	21.12.13
Jun. 29	Montanarius, & Maraldi literæ	39416 38380	21.30.44 20.59.49	21.31. 3 21. 0. 8	30.55	21.15.35
Jul. 6	ex literis Maraldi. In MSS. Mont. limbus ſup. 39546	40588 39542	22. 5.28 21.34.29	22. 5.48 21.34.48	31. 0	21.50.18
Jul. 9	ex iiſdem literis. Sed in MSS. Mont. 41300, 40244	41282 40246	22.25.55 21.55.22	22.26.15 21.55.42	30.33	22.10.58
Jul. 16	ex iiſdem literis. In MSS. Mont. limbus inf. 43427	43424 42362	23.28.21 22.57.30	23.28.42 22.57.51	30.51	23.13.16

1672		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 3	ex iiſdem literis. Mont. in MSS. habet 76848, & 75210, unde enormis diameter Solis	76748 75310	37.30.20 36.59. 0	37.31. 0 36.59.39	31.21	37.15.19
Sept. 11 *	ex MSS. Mont., & Maraldi literis	85467 83898	40.31.11 39.59.36	40.31.56 40. 0.20	31.36	40.16. 8
Sept. 15	Montan. & Maraldi literæ	90250 88598	42. 3.59 41.32.25	42. 4.46 41.33.12	31.34	41.48.59
Sept. 21	ex iiſdem	97938 96145	44.24.12 43.52.27	44.25. 3 43.53.18	31.45	44. 9.10
Sept. 22 *	ex iiſdem	99270 97474	44.47.24 44.16. 2	44.48.15 44.16.53	31.22	44.32.34
Sept. 23 *	ex iiſdem; atque hæc poſtrema eſt obſervatio in Maraldi literis	100638 98809	45.10.56 44.39.24	45.11.48 44.40.15	31.33	44.56. 1
Oct. 8	ex MSS. Montanarii	123528 121244	51. 0.32 50.29. 5	51. 1.36 50.30. 8	31.28	50.45.52
Oct. 10	ex iiſdem	126912 124610	51.45.50 51.15.10	51.46.56 51.16.15	30.41	51.31.35
Oct. 15		135825 133244	53.38.16 53. 6.42	53.39.27 53. 7.52	31.35	53.23.39
Oct. 21		147227 144346	55.48.53 55.17.11	55.50.11 55.18.27	31.44	55.34.19
Oct. 27		159372 156149	57.53.36 57.21.50	57.55. 2 57.23.13	31.49	57.39. 7
Dec. 1		232573 226752	66.44. 1 66.12. 7	66.46. 9 66.14.11	31.58	66.30.10
Dec. 4		237230 232250	67. 8.34 66.42.17	67.10.43 66.44.25	26.18	

1672		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 24	Hæc obſervatio extra aliarum ſeriem notatur in MSS. Montan. ubi ſubdit Solem diſtare a Tropico min. 3. 0, quod optime in hunc diem convenit	249425 242816	68. 9.11 67.36.59	68.11.28 67.39.12	32.16	67.55.20
Dec. 28	ex iiſdem MSS.	247210 240735	67.58.33 67.26.32	68. 0.49 67.28.44	32. 5	67.44.47
Dec. 29		246418 239972	67.54.43 67.22.39	67.56.59 67.24.51	32. 8	67.40.55
1673						
*Jan.*1	ex MSS. Montanarii	243580 237228	67.40.47 67. 8.34	67.43. 1 67.10.46	32.15	67.26.53
*Jan.*2	ex iiſdem. Sed ſuſpicor pertinere ad diem 3	241193 235008	67.28.51 66.56.57	67.31. 3 66.59. 6	31.57	67.15. 4
*Jan.*11		226960 223288	66.13.17 65.52.29	66.15.21 65.54.31	20.50	
*Jan.*13	Hæc obſervatio in MSS. Montanarii notatur die 12, ſed vere ad diem 13 pertinet	225325 219784	66. 4. 5 65.32. 5	66. 6. 8 65.34. 5	32. 3	65.50. 6
Mar. 26		90704 89048	42.12.34 41.41. 5	42.13.21 41.41.51	31.31	41.57.36
Apr. 8		76010 74576	37.14.19 36.42.51	37.14.58 36.43.29	31.29	36.59.14
Apr. 13	Quædam hìc ſubdit Montanarius, quibus indicare videtur obſervationi ſe diffidere	71070 69800	35.24. 5 34.54.55	35.24.41 34.55.30	29.11	35.10. 6
Apr. 14	Addit obſervatorum nomina *D.Manzius cum Fabrio*	70148 68793	35. 2.57 34.31.30	35. 3.32 34.32. 5	31.27	34.47.48

1673		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 15	ex MSS. Montan. *cælo ſer.*	69215 67880	34.41.22 34.10. 9	34.41.57 34.10.44	31.13	34.26.20
Apr. 22	*Cælo ſubnubilo*	63150 61900	32.16.22 31.45.28	32.16.54 31.45.59	30.55	32. 1.27
Apr. 23	ut ſupra	62346 61110	31.56.31 31.25.45	31.57. 3 31.26.16	30.47	31.41.40
Apr. 29		57808 56615	30. 1.54 29.31. 0	30. 2.23 29.31.29	30.54	29.46.56
Maj. 5	*cum D. Valente Medico, & Antiquario Regis Chriſtianiſs.*	53771 52614	28.16. 3 27.45. 3	28.16.30 27.45.30	31. 0	28. 1. 0
Jun. 21		38905 37865	21.15.31 20.44.21	21.15.50 20.44.40	31.10	21. 0.15
Jun. 22	Subdit Solem diſtitiſſe a Tropico ſec. 24. Atque hæc in hiſce MSS. noviſſima eſt obſervatio	38918 37880	21.15.54 20.44.48	21.16.13 20.45. 7	31. 6	21. 0.40
1674						
Jan. 24	ex MSS. Julii Cæſaris Calcinæ *Cælo ſubnubilo*. In hoc libello obſervationes a Mengolo, aut ſociis habitas ipſe exſcripſerat	203075 198440	63.46.59 63.15.18	63.48.49 63.17. 5	31.44	63.32.57
Jan. 26	ex eodem. *Cælo ſereno*	198705 194202	63.17. 9 62.45.17	63.18.56 62.47. 2	31.54	63. 2.59
Jan. 27	ex eodem	196472 192090	63. 1.30 62.29.56	63. 3.16 62.31.40	31.36	62.47.28
Jan. 30		189700 185990	62.12.15 61.44. 6	62.13.58 61.45.47	28.11	
Feb. 3	*Sole claro*	180915 177030	61. 4. 7 60.32.20	61. 5.45 60.33.56	31.49	60.49.50

Feb.

1674		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Feb. 5	ex iiſdem MSS. *Sole claro*	176488 172712	60.27.49 59.55.45	60.29.25 59.57.19	32. 6	60.13.22
Feb. 28		130110 127715	52.27.17 51.56.21	52.28.25 51.57.27	30.58	52.12.56
Mar. 7		118230 116050	49.46.30 49.14.55	49.47.32 39.15.56	31.36	39.31.44
Mar. 16		104423 102518	46.14.22 45.42.45	46.15.16 45.43.38	31.38	45.59.27
Mar. 21		97475 95705	44.16. 3 43.44.35	44.16.54 43.45.25	31.29	44. 1. 9
Mar. 23	*Sole ſuboſcuro*	94808 93103	43.28.24 42.57.16	43.29.14 42.58. 5	31. 9	43.13.39
Mar. 28	*Sole claro*	88545 86934	41.31.24 41. 0. 6	41.32.11 41. 0.52	31.19	41.16.31
Apr. 3		81582 80700	39.12.30 38.41. 4	39.13.13 38.41.46	31.27	38.57.29
Apr. 10		74220 72825	36.34.59 36. 3.50	36.35.27 36. 4.17	31.10	36.19.52
Jun. 11		39562 38530	21.35. 5 21. 4.18	21.35.24 21. 4.37	30.47	21.20. 0
Jun. 13		39320 38288	21.27.53 20.57. 4	21.28.12 20.57.23	30.49	21.12.47
Jun. 19		38920 37885	21.15.58 20.44.16	21.16.17 20.45.15	31. 2	21. 0.46
Jun. 20		38910 37870	21.15.41 20.44.30	21.16. 0 20.44.49	31.11	21. 0.24
Jun. 22		38905 37877	21.15.31 20.44.42	21.15.50 20.45. 1	30.49	21. 0.25

1675		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 12	ex ephemeride Fabrii hujus anni, obſervantibus Montanario, atque ipſo Fabrio	228020 222362	66.19.11 65.47. 9	66.21.16 65.49.11	32. 5	66. 5.13
Mar. 31	ex adverſariis Gulielmini *claro*	85248 83718	40.26.49 39.56. 8	40.27.34 39.56.52	30.42	40.12.13
Apr. 3	ex iiſdem adverſariis, ubi appoſita eſt nota ♀ indicans diem Veneris, at mendoſe, fuit enim dies ☿. *pallido*	81940 80367	39.19.53 38.47.16	39.20.36 38.47.58	32.38	39. 4.17
Apr. 5	ex iiſdem *claro*	79697 78195	38.33.14 38. 1.25	38.33.56 38. 2. 6	31.50	38.18. 1
Nov. 6	*Sole languido*	179244 175530	60.50.34 60.19.46	60.52.11 60.21.21	30.50	60.37.46
Nov. 14	ex iiſdem *Sole pallido*	196828 192537	63. 4. 1 62.33.12	63. 5.47 62.34.56	30.51	62.50.21
Dec. 4	ex iiſdem *Sole tremulo*	236142 230163	67. 2.55 66.30.59	67. 5. 4 66.33. 5	31.59	66.49. 4
Dec. 11	*Claro*	244930 238537	67.47.37 67.15.20	67.49.52 67.17.30	32.22	67.33.41
Dec. 12	*Sole tremulo*	245834 239409	67.51.53 67.19.48	67.54. 8 67.21.58	32.10	67.38. 3
1676						
Jan. 20	ex adverſaris Gulielmini *Sole claro, at ſuſpecta & ſero*	212780 207627	64.49.40 64.16.58	64.51.36 64.18.50	32.46	64.35.13
Feb. 8	*Sole claro*	170960 167380	59.40.31 59. 8.39	59.42. 4 59.10.10	31.54	59.26. 7
Feb. 15	*Sole tremulo, ſed tutiſſimam arbitror*	156092 152977	57.21.16 56.49.15	57.22.40 56.50.36	32. 4	57. 6.38

Feb.

1676		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Feb. 16	ex adverſ. Guliel. *Sole claro*	154048 150993	57. 0.38 56.29. 3	57. 2. 0 56.30.23	31.37	56.46.11
Feb. 19	*apud D. Montanarium*					
Feb. 20	*apud D. Montanarium*. Deſiderantur itaque horum dierum obſervationes, cum neque in MSS. Montanarii eas reperim					
Feb. 23	*Sole claro*	140230 137547	54.30.25 53.58.55	54.31.38 54. 0. 7	31.31	54.15.52
Feb. 25	*Sole claro*	136465 133860	53.46. 0 53.14.18	53.47.11 53.15.28	31.43	53.31.19
Feb. 26	*Sole claro*	134643 132098	53.23.55 52.52.26	53.25. 6 52.53.36	31.30	53. 9.21
Feb. 27	*Sole claro*	132830 130298	53. 1.34 52.29.41	53. 2.44 52.30.49	31.55	52.46.46
Feb. 28	*Sole claro*	131013 128554	52.38.46 52. 7.17	52.39.55 52. 8.24	31.3[illegible]	52.24. 9
Feb. 29	*Sole claro*	129231 126802	52.16. 2 51.44.24	52.17.10 51.45.30	31.40	52. 1.20
Mar. 2	*Sole tremulo*	125735 123777	51.30.14 51. 3.55	51.31.20 51. 4.59	26.21	
Mar. 5	*Sole claro*	120665 118440	50.21. 0 49.49.32	50.22. 3 49.50.34	31.29	50. 6.18

Mar.

1676		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 11	*Sole claro. Suſpecta valde quod ſpecies Solis inciderit prope columnam.* Nimirum hoc loco meridiana linea columnarum duarum auſtralem diſtringit, ibique lineæ libramentum nonnihil depreſſum Gulielminus a Montanario accepiſſe potuit. Vide quæ de hujus examine diximus capite octavo	111125 109064	48. 0.59 47.28.57	48. 1.57 47.29.54	32. 3	47.45.55
Mar. 16	*Sole claro*	103685 101797	46. 2.12 45.30.38	46. 3. 6 45.31.31	31.35	45.47.18
Mar. 19	*Sole tremulo*	99495 97680	44.51.19 44.19.40	44.52.11 44.20.31	31.40	44.36.21
Mar. 20	*Sole pallido. Fallaciſſime quod ſero advenerim*	98125 96350	44.27.28 43.56. 6	44.28.19 43.56.57	31.22	44.12.38
Mar. 25	*Sole claro*	91606 89928	42.29.30 41.57.52	42.30.18 41.58.39	31.39	42.14.28
Apr. 8	*Sole claro*	75730 74297	37. 8.13 36.36.41	37. 8.52 36.37.19	31.33	36.53. 5
Oct. 27		159362 156187	57.53.30 57.22.13	57.54.56 57.23.37	31.19	57.39.16
Nov. 5	*Sole pallido*	178728 174882	60.46.41 60.14.19	60.48.17 60.15.54	32.23	60.31. 6
Nov. 26	*Sole pallido*	223645 218190	65.54.31 65.22.38	65.56.34 65.24.37	31.57	65.40.35
Dec. 3	*Sole pallido*	235773 229825	67. 0.59 66.29. 8	67. 3. 8 66.31.14	31.54	66.47.11
Dec. 6	*Sole pallido*	240030 233860	67.22.58 66.50.54	67.25. 9 66.53. 2	32. 7	67. 9. 5

Dec.

		Tangentes correctæ a penumbra	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
1676			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 7	ex adverſariis Gulielmini *Sole tremulo*	241300 235175	67.29.23 66.57.50	67.31.35 66.59.59	31.36	67.15.47
1677						
Jan. 20	ex iiſdem *Sole pallido*	211110 206170	64.39.13 64. 7.30	64.41. 8 64. 9.22	31.46	64.25.15
Apr. 16	*Sole claro dubia*	68330 66965	34.20.42 33.48.30	34.21.17 33.49. 5	32.12	34. 5.11
Nov. 16	*Sole languido*	202407 197855	63.42.30 63.11.13	63.44.19 63.13. 0	31.19	63.28.39
Nov. 22		215193 210096	65. 4.33 64.32.49	65. 6.30 64.34.43	31.47	64.50.36
Nov. 24		219277 213990	65.29. 6 64.57.10	65.31. 6 64.59. 7	31.59	65.15. 6
Nov. 27		225094 219570	66. 2.47 65.30.49	66. 4.50 65.32.49	32. 1	65.48.49
Nov. 29		228750 223050	66.23.13 65.51. 7	66.25.18 65.53.10	32. 8	66. 9.14
1678						
Mar. 10	ex iiſdem *Sole limpido*	113404 111330	48.35.39 48. 4. 8	48.36.39 48. 5. 6	31.33	48.20.52
Mar. 11	*Sole claro*	111842 109806	48.11.59 47.40.32	48.12.58 47.41.30	31.28	47.57.14
Mar. 13	*Sole claro*	108808 106805	47.24.56 46.53. 5	47.25.53 46.54. 1	31.52	47. 9.57
Mar. 22	*Sole pallido*	96090 94345	43.51.28 43.20. 0	43.52.19 43.20.50	31.29	43.36.34

		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1679			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 20	ex adverſariis Gulielmini *Sole claro*	145540 142687	55.30.26 54.58.33	55.31.43 54.59.48	31.55	55.15.45
Feb. 21	*Sole pallido*	143568 140815	55. 8.30 54.37.10	55. 9.46 54.38.24	31.22	54.54. 5
Mar. 17	*Dubia Sole pallido*	103333 101396	45.56.21 45.23.49	45.57.15 45.24.42	32.33	45.40.58
Mar. 18	*Sole claro dubia*	101950 100050	45.33.12 45. 0.50	45.34. 5 45. 1.42	32.23	45.17.54
Mar. 19	*Sole claro*	100535 98688	45. 9.10 44.37.19	45.10. 2 44.38.11	31.51	44.54. 6
1684						
Jul. 6	ex iiſdem	40645 39610	22. 7.11 21.36.31	22. 7.31 21.36.51	30.40	21.52.11
Jul. 8	Ad hanc obſervationem notat Gulielminus vitiatum eſſe Heliometrum D. Petronii. Vide quæ diximus cap.9	41105 40050	22.20.43 21.49.35	22.21. 3 21.49.55	31. 8	22. 5.29
Jul. 10		41613 40575	22.35.38 22. 5. 6	22.35.59 22. 5.26	30.33	22.20.42
Jul. 11		41905 40850	22.44.11 22.13.13	22.44.32 22.13.33	30.59	22.29. 2
Jul. 12		42194 41138	22.52.37 22.21.42	22.52.58 22.22. 2	30.56	22.37.30
Jul. 13	*Sole claro*	42492 41428	23. 1.18 22.30.12	23. 1.39 22.30.32	31. 7	22.46. 5
Jul. 14	*Sole claro*	42825 41755	23.11. 0 22.39.48	23.11.21 22.40. 9	31.12	22.55.45
Jul. 15	*Sole claro*	43145 42082	23.20.18 22.49.21	23.20.39 22.49.42	30.57	23. 5.10

Jul.

1684		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jul. 18	ex adv. Gul. *Sole claro*	44220 43140	23.51.18 23.20. 7	23.51.39 23.20.28	31.11	23.36. 3
Jul. 22	*Sole claro*	45840 44765	24.37.38 24. 6.57	24.38.10 24. 7.19	30.51	24.22.44
1690						
Apr. 13	ex libello MS. Gulielmini, in quo Solis locum dietim ex obſervationibus ſupputabat. Ad hunc diem notat Heliometrum vitiatum eſſe. Subdit nomen obſervatoris *Oretus*; deinde addit *quoniam perpendiculum in ſtatu præſenti breve eſt, & fortaſſe lamina foraminis vergit aliqualiter ad Auſtrum, hinc tangentes breviores evadunt, & minor angulus diſtantiæ centri Solis a vertice, & per conſequens major conſurgit declinatio Solis, ex qua majorem diſtantiam a primo puncto Arietis oſtendit Gnomon D. Petronii*	71238 69890	35.27.45 34.57. 0	35.28.21 34.57.36	30.45	35.12.58
Apr. 27	ex adv. Gul. & ex eod. libello, ubi ſubdit *eſt autem radius certiſſime brevior, & lamina non eſt horizontalis, ut ex diametro nimis magna aperte dignoſcitur*	59387 58158	30.42. 8 30.10.53	30.42.38 30.11.22	31.16	30.27. 0
Jun. 1	ex eodem Gulielmini libello, ubi ſubdit nomen obſervatoris *Exc. Donellus*, additque *ad heliometrum D. Petronii cujus tamen centrum in ſuo ſitu, & differentia altitudinis gnomonis cenſetur* 10 *particularum*	41602 40540	22.35.19 22. 4. 4	22.35.50 22. 4.24	31.26	22.20. 7

1690		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 2	ex adverſariis Guliel. *Sole claro cum Gnomon eſſet altior debito 4 particulis circiter*. In libello addit obſervatorum nomina *Donellus*, & *Sandrius*	41320 40288	22.27. 2 21.56.37	22.27.22 21.56.57	30.25	22.12. 9
Jun. 6	ex adverſ. Gul. *Gnomone ut ſupra conſtituto*	40402 39365	22. 0. 0 21.29.14	22. 0.20 21.29.33	30.47	21.44.56
*Jun.*10	ex adverſariis Gul. ubi ſubdit *Gnomone recte, ut videtur, conſtituto, dubiiſſima*. In libello autem ſupputationum ad hanc obſervationem hæc notat. *Gnomone recte ſe habente quoad omnia, dubiiſſima tamen, eo quod tangentes ſumptæ ſint per relationem ad ſpeciem extra lineam poſt meridiem, cum in meridie nubes eam obvelaverint*	39703 38665	21.39.18 21. 8.21	21.39.38 21. 8.40	30.58	21.24. 9
*Jun.*18	ex adv. Guliel. *Sole tremulo*	38980 37938	21.17.45 20.46.33	21.18. 4 20.46.52	31.12	21. 2.28
*Jun.*19	ex iiſdem. *Sole admodum tremulo*	38942 37912	21.16.38 20.45.47	21.16.57 20.46. 6	30.51	21. 1.31
*Jun.*20	ex iiſdem *Sole claro*	38930 37900	21.16.16 20.45.25	21.16.35 20.45.44	30.51	21. 1. 9
*Jun.*21	*Sole claro*	38924 37894	21.16. 6 20.45.14	21.16.25 20.45.33	30.52	21. 0.59
*Jun.*22	*Sole claro cælo ſubnubilo*	38940 37912	21.16.35 20.45.47	21.16.54 20.46. 6	30.48	21. 1.30

Jun.

1690		Tangentes correctæ apenumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 23	ex libello ſupputationum Guliel. In adverſariis autem habet 39000, & 38127 incorrectæ, quæ correctæ ſunt 38950, 38177, unde fit Solis diameter perquam exigua, itaque libelli numeros prætuli. Addit in adverſariis *Sole pallido cælo nubilo*	38950 37919	21.16.53 20.46. 0	21.17.12 20.46.19	30.53	21. 1.45
Jun. 24	ex eodem libello *Sole tremulo cælo tamen ſereniſſimo exactiſſima*	38993 37967	21.18. 9 20.47.25	21.18.28 20.47.44	30.44	21. 3. 6
Jun. 27	ex eodem libello. Extat etiam hæc obſervatio in adverſariis *Sole pallido cælo nubilo*. Sed limbi ſuperioris numeri ambigue ſcripti	39200 38177	21.24.19 20.53.44	21.24.38 20.54. 3	30.35	21. 9.20
Jun. 28	ex adverſariis Guliel. *Sole claro, ſed cælo ſubnubilo*	39292 38261	21.27. 4 20.56.15	21.27.23 20.56.34	30.49	21.11.58
Jun. 29	ex libello ſupputationum *dubia, quia ſpecies pallida, & obſervatio ſumpta eſt cauſa nubium per relationem ad ſpeciem extra lineam*	39410 38382	21.30.34 20.59.53	21.30.53 21. 0.12	30.41	21.15.32
Jul. 3	ex adverſariis Guliel. & libello ſupputationum	39972 38930	21.47.16 21.16.16	21.47.36 21.16.35	31. 1	21.32. 5
Jul. 4	ex iiſdem	40145 39110	21.52.24 21.21.38	21.52.44 21.21.57	30.47	21.37.21
Jul. 5	ex iiſdem	40340 39298	21.58.10 21.27.15	21.58.30 21.27.34	30.56	21.43. 2
Jul. 6	ex iiſdem	40545 39500	22. 4.13 21.33.15	22. 4.33 21.33.34	30.59	21.49. 3

1690		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jul. 7	ex libello ſupputationum *Sole claro ego ſolus exactiſſima*	40764 39716	22.10.41 21.39.40	22.11. 1 21.40. 0	31. 1	21.55.30
Jul. 12	ex adverſ. & libello ſupputationum	42055 41010	22.48.34 22.17.55	22.48.55 22.18.15	30.40	22.33.35
Jul. 14	ex adverſ. & libello. In adverſ. ſubdit *Sole pallidiſſimo, ut vix ſpeciei termini poſſent diſtingui, qui tamen rectificati ſunt per limbos terminatiores extra lineam*	42667 41618	23. 6.23 22.35.47	23. 6.44 22.36. 8	30.36	22.51.26
Jul. 15	ex adverſ. *Sole pallido cælo nub.* Sed in libello ſupputationum tangens limbi ſup. incorrecta 41886, unde correcta 41936	42982 41942	23.15.34 22.45.15	23.15.55 22.45.36	30.19	23. 0.45
Jul. 16	ex libello ſupputationum Guliel. *Sole claro, ſed tremulo & cælo ſereno*	43339 42287	23.25.54 22.55.19	23.26.16 22.55.40	30.36	23.10.58
Jul. 18	ex adverſ. *Sole claro cælo ſubnubilo*	44057 43002	23.46.37 23.16. 8	23.46.59 23.16.29	30.30	23.31.44
Jul. 19	ex adv. *dubia propter nubes*	44424 43358	23.57.10 23.26.26	23.57.32 23.26.47	30.45	23.42. 9
Jul. 20	ex adverſ. *Sole claro*	44828 43760	24. 8.46 23.38. 4	24. 9. 8 23.38.26	30.42	23.53.47
Sept. 7	ut ſupra	80658 79160	38.53.21 38.21.55	38.54. 4 38.22.37	31.27	38.38.20
Sept. 12	ex iiſdem *Sole claro*. Hanc & duas ſequentes obſervationes Gulielminus die uno antevertit, ſed Solis longitudo diem prodit	86280 84705	40.47.16 40.15.59	40.48. 1 40.16.43	31.18	40.32.22

Sept.

1690		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 13	ex iiſdem *Sole diluto*	87462 85862	41.10.25 40.39. 0	41.11.11 40.39.45	31.26	40.55.28
Sept. 14	ex iiſdem *Sole claro Sandrius*	88670 87030	41.33.49 41. 2. 0	41.34.36 41. 2.46	31.50	41.18.41
Sept. 17	ex iiſdem *Sole claro*	92348 90653	42.43. 8 42.11.36	42.43.56 42.12.23	31.33	42.28. 9
Sept. 18	ex iiſdem *Sole claro, ſed cælo nubilo*	93585 91903	43. 6. 8 42.35. 2	43. 6.57 42.35.50	31. 7	42.51.23
Sept. 19	ex iiſdem *Sole claro Sandrius*	94878 93165	43.29.40 42.58.25	43.30.30 42.59.14	31.16	43.14.52
Sept. 20	*Sole claro*	96179 94430	43.53. 3 43.21.33	43.53.54 43.22.22	31.32	43.38. 8
Sept. 21	*Sole claro*	97502 95728	44.16.32 43.44.59	44.17.23 43.45.50	31.33	44. 1.36
Sept. 22	*Sole claro*	98835 97058	44.39.52 44. 8.41	44.40.44 44. 9.32	31.12	44.25. 8
Sept. 23	*Sole languido*	100215 98393	45. 3.42 44.32.10	45. 4.34 44.33. 2	31.32	44.48.48
Sept. 24	*Sole tremulo*	101578 99745	45.26.55 44.55.37	45.27.48 44.56.29	31.19	45.12. 8
Sept. 26	*Sole languidiſſimo dubia*	104400 102520	46.14. 0 45.42.47	46.14.54 45.43.40	31.14	45.59.17
Sept. 27	*Sole languido*	105842 103940	46.37.33 46. 6.25	46.38.28 46. 7.19	31. 9	46.22.53
Oct. 5	*Sole languidiſſimo, ut vix termini poſſent diſtingui*	118068 115908	49.44.12 49.12.50	49.45.13 49.13.50	31.23	49.29.31
Oct. 9	*Sole diluto*	124680 122390	51.16. 7 50.44.57	51. 7.12 50.46. 0	31.12	51. 1.36

Oct.

1690		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 13	ex iiſd. *Sole languido dubia*	131638 129178	52.46.40 52.15.21	52.47.49 52.16.29	31.20	52.32. 9
Oct. 30	*Sole languido cælo nubilo*	164902 161563	58.46. 0 58.14.40	58.47.29 58.16. 7	31.22	58.31.48
1691						
Dec. 20	Ex libello ſupputationum Gulielmini *Sole nubilo Donellus*, ubi tangentem minorem conſignat 243645, quæ correcta eſt 243695. Sed veriorem eſſe eam, quam ex ſcheda libello incluſa deſumpſi, & prætuli, oſtendit Solis diameter	250020 243405	68.12. 1 67.39.55	68.14.18 67.42.10	32. 8	67.58.14
Dec. 23	ex eodem MS. *non exacta Donellus*. Hæc quoque obſervatio una cum ſupputatione exarata erat in ſcheda libello incluſa cum adjecta nota *non exacta*	249950 243305	68.11.41 67.39.25	68.13.58 67.41.38	32.20	67.57.48
Dec. 27	ex libello ſupputationum Gulielmini. *Ego cum Donello Sole limpido ſpecie diluta*	248327 241805	68. 3.56 67.31.56	68. 6.12 67.34. 9	32. 3	67.50.10
Dec. 28	ex eodem MS. *Donellus tangens minor, nam alia haberi non potuit propter coadjutoris defectum*	 241222	 67.29. 0	 67.31.13		
Dec. 29	ex eodem MS. *Donellus, & ego, & ſpecie clara*	246960 240515	67.57.21 67.25.25	67.59.37 67.27.38	31.59	67.43.37
Dec. 30	ex eodem MS. *Donellus Sole claro certa. tangens minor*	 239738	 67.21.28	 67.23.40		

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
*Jan.*8	Ex adverſariis Gulielmini, quorum liber tertius ab hac ipſa obſervatione incipit, ubi initio notat obſervationes ſubſequentes a ſe ipſo cum Caſſino, hujuſque filio fuiſſe habitas; tunc enim degebat Bononiæ Caſſinus, & reſtaurando huic Gnomoni operam dabat, ut a nobis dictum eſt capite 10. In libello autem ſupputationum notatur ad hunc diem *ego cum D. Caſſino*, tangens vero limbi ſuperioris major eſt particulis 20, quam quæ hic conſignatur. In adverſariis habita dicitur obſervatio *Sole languido*	234618 228717	66.54.55 66.23. 2	66.57. 4 66.25. 7	31.57	66.41. 5
*Jan.*9	ex iiſd. adverſ. *Sole languido*. In libello ſupputationum notatur *Donellus cum Paſio*	232988 227180	66.46.14 66.14.31	66.48.20 66.16.35	31.45	66.32.27
*Jan.*10	ex iiſdem adverſariis *Sole pallidiſſimo*	231356 225593	66.37.28 66. 5.37	66.39.35 66. 7.40	31.55	66.23.37
*Jan.*17	*Sole pallidiſſimo*	218265 212960	65.23. 5 64.50.48	65.25. 4 64.52.44	32.20	65. 8.54
*Jan.*22	*Sole pallido*	207666 202770	64.17.14 63.44.56	64.19. 7 63.46.45	32.22	64. 2.56
*Jan.*23	*Sole pallido*	205496 200120	64. 3. 4 63.28.55	64. 4.55 63.28.43	36.12	
Feb. 1	*Sole pallido* dein ſubdit Gnomonem depreſſiorem eſſe particulis 40. In libello autem ſupputationum addit obſervatorum nomina. *D. Jacobus Caſſinus, & ego*	185598 181600	61.41. 8 61. 9.37	61.42.49 61.11.16	31.33	61.27. 2

Mar.

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 19	ex adverſariis Gulielmini. *Sole pallido*, & ſubdit: *poſt reaptationem perfectam Gnomonis Divi Petronii*. In libello ſupputationum hæc habet. *Reſtituto Gnomone Divi Petronii per D. Jo: Domini cum Caſſinum &c. prima obſervatio fuit die 19 Martii 1695. Sole languido. Ego cum D. Mezzavacca*	100368 98538	45. 6.19 44.34.41	45. 7.11 44.35.33	31.38	44.51.22
Mar. 21	ex adverſariis Gulielmini *Sole languidimo, & apparente ipſo momento meridiei*	97615 95855	44.18.31 43.47.16	44.19.22 43.48. 6	31.16	44. 3.44
Mar. 23	ex adverſariis Gulielmini: *Sole languidiſſimo ego cum D. Bordono*. Tangens limbi ſuperioris notatur incorrecta 93225 (ubi ambigi poteſt an 35) cui ſubſcriptum eſt 243 cum hac nota *verior ut puto primo accepta, ſed non exacta*. In libello autem ſupputationum notat incorrectam 93225, quæ correcta a penumbra eſt 93275, atque hanc lectionem ſecuti ſumus	94956 93275	43.31. 6 43. 0.27	43.31. 6 43. 1.16	30.40	43.16.36
Mar. 29	*Cum D. Oreto Sole claro, ſed tremulo exacta* hæc in adverſariis, ubi minorem tangentem conſignat 85880, quæ correcta a penumbra eſt 85930; ſed prætuli numeros, quos tradit in libello ſupputationum	87485 85870	41.10.52 40.39.10	41.11.38 40.39.55	31.43	40.55.46

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 2	Gul. in adv. *Sole claro exacta*	82835 81313	39.38.12 39. 6.56	39.38.56 39. 7.39	31.17	39.23.17
Apr. 3	ex iiſd.adv. *Sole claro, & ſereno*	81717 80210	39.15.18 38.44. 0	39.16. 1 38.44.43	31.18	39. 0.22
Apr. 4	*Sole pallidiſſimo, ut vix ſpeciei margines diſtinguerentur*	80633 79160	38.52.49 38.21.54	38.53.32 38.22.36	30.56	38.38. 4
Apr. 5	*Sole claro, ſed nebula ſpeciem intercurrente*	79535 78050	38.29.50 37.58.21	38.30.32 37.59. 2	31.30	38.14.47
Apr. 6	*Sole claro, ſed tremulo, & flante vento ab Oriente*	78456 77000	38. 6.59 37.35.47	38. 7.40 37.36.27	31.13	37.52. 3
Apr. 7	*Tangentes calculatæ ex ephem. Mezzavacchæ pro die 7 ejuſdem redact. ad merid. appar. 77457, 75915 obſervari non potuerunt propter nubes.* Hæc in adverſariis Gulielmini					
Apr. 8	ex iiſdem adverſariis. *Sole pallido, & ſpecie inter nubium hiatus identidem apparente*	76365 74945	37.22. 3 36.51. 0	37.22.43 36.51.39	31. 4	37. 7.11
Apr. 10	*Sole pallidiſſimo, & dubia, quia ſumpta extra lineam*	74360 72988	36.38. 5 36. 7.30	36.38.43 36. 8. 7	30.36	36.23.25
Apr. 11	*Sole claro, & cælo ſereno*	73420 71916	36.17.10 35.43.20	36.17.47 35.43.57	33.50	
Apr. 13	*Sole pallido, & cælo nubiloſo*	71398 70078	35.31.33 35. 1.19	35.32.10 35. 1.55	30.15	35.17. 2
Apr. 14	*Sole claro, ſed inter hiatus ec.*	70480 69123	35.10.35 34.39.13	35.11.11 34.39.49	31.22	34.55.30
Apr. 20	*Sole languido D. Uccellus*	65135 63843	33. 4.42 32.33.19	33. 5.15 32.33.52	31.23	32.49.33

1695		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 22	*Sole claro cælo ſereno, ſpecie tremula, exacta quoad omnia.* Ego cum D. *Uccello, & Paſio*	63468 62202	32.24. 9 31.52.57	32.24.41 31.53.29	31.12	32. 9. 5
Apr. 23	*Sole pallido, ſpecie tremula, cælo ad merid. nubilo*	62643 61405	32. 3.52 31.33. 7	32. 4.24 31.33.38	30.46	31.49. 1
Apr. 25	*Sole claro.* Obſervationum adjuncta, quæ Solis, cælique conſtitutionem ſpectant a Gulielmino prolixe deſcripta deinceps brevitatis ſtudio in pauciora contraham	61074 59828	31.24.51 30.53.29	31.25.21 30.53.59	31.22	31. 9.40
Apr. 26	*Sole claro*	60300 59076	31. 5.25 30.34.23	31. 5.55 30.34.53	31. 2	30.50.24
Apr. 27	*Sole claro*	59547 58324	30.46.22 30.15. 9	30.46.52 30.15.38	31.14	30.31.15
Apr. 28	*Sole claro*	58805 57595	30.27.27 29.56.25	30.27.56 29.56.54	31. 2	30.12.25
Apr. 29	*Sole claro*	58077 56867	30. 8.48 29.37.33	30. 9.17 29.38. 2	31.15	29.53.39
Apr. 30	*Sole claro*	57365 56156	29.50.27 29.19. 0	29.50.56 29.19.28	31.28	29.35.12
Maj. 2	*Sole pallido*	55973 54793	29.14.14 28.43.11	29.14.42 28.43.39	31. 3	28.59.10
Maj. 3	*Sole claro*	55301 54128	28.56.35 28.25.33	28.57. 3 28.26. 0	31. 3	28.41.31

1695		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ' ''	*Diſt. a vertice vera limborum* G ' ''	*Diam. app. Solis* ' ''	*Diſt. a vertice vera centri* G ' ''
Maj. 4	*Sole pallido. Calculatæ fuerant prius tangentes ex ephemeride Mezzavacchæ, habita ratione inæqualitatis dierum, & meridie obſervatæ ſunt quadrare ſpeciei Solari.* Hæc in adverſariis. In libello autem ſupputationum tangentes ipſas conſignat computo inventas, aitque obſervationem cum iis conſentiſſe *ſatis exacte;* itaque eas in obſervationum ſeriem hic retulimus. Computus autem, quo uſus eſt, ponit Solem in ♉ 14 6. 1 merid. æquali, & meridie apparent. 14.6.10, obliquitatem eclipticæ gr. 23. 29. 0 & latitudinem Bononiæ gr. 44 30. 15	54645 53479	28.39.16 28. 8.15	28.39.44 28. 8.42	31. 2	28.24.13
Maj. 5	*Sole claro*	54003 52838	28.22.13 27.51. 4	28.22.40 27.51.32	31. 8	28. 7. 6
Maj. 6	*Sole pallido*	53368 52217	28. 5.16 27.34.20	28. 5.43 27.34.47	30.56	27.50.15
Maj. 8	*ut ſupra*	52146 50996	27.32.25 27. 1.12	27.32.52 27. 1.38	31.14	27.17.15
Maj. 10	*Sole claro, & ſpecie parum tremulo*	50977 49838	27. 0.41 26.29.27	27. 1. 7 26.29.52	31.15	26.45.29
Maj. 11	*Claro, valde tremula ſpecie*	50414 49282	26.45.17 26.14. 7	26.45.43 26.14.31	31.12	26.30. 7
Maj. 12	*pallido.* In libello. Supputationum tangens limbi inferioris minor eſt quam hic particulis 10	49865 48736	26.30.12 25.58.58	26.30.37 25.59.22	31.15	26.14.59

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Maj. 14	*Sole claro*	48804 47681	26. 0.52 25.29.34	26. 1.16 25.29.57	31.19	25.45.36
Maj. 15	*Sole claro ſpecie tremula*	48297 47180	25.46.45 25.15.29	25.47. 9 25.15.52	31.17	25.31.30
Maj. 17	*Sole pallidiſſimo, ſpecie firma*	47290 46210	25.18.34 24.48. 7	25.18.57 24.48.30	30.27	25. 3.43
Maj. 18	*Sole pallidiſſimo, ſpecie firma*	46836 45746	25. 5.48 24.34.55	25. 6.11 24.35.18	30.53	24.50.44
Maj. 22	*Sole pallidiſſimo*	45083 44034	24.16. 2 25.45.57	24.16.24 23.46.19	30. 5	24. 1.21
Maj. 23	*Sole pallidiſſimo*	44633 43647	24. 3.10 23.34.48	24. 3.32 23.35.10	28.22	23.49.21
Maj. 24	*Sole claro*	44301 43223	23.53.38 23.22.32	23.54. 0 23.22.53	31. 7	23.38.26
Maj. 27	*Sole claro*	43175 42136	23.21. 9 22.50.56	23.21.30 22.51. 7	30.23	23. 6.18
Maj. 31	*Sole claro*. Sed proculdubio mendum eſt in tangente limbi inferioris	41050 40891	22.19. 5 22.14.25	. . . . 22.14.45		
Jun. 1	*Sole pallido*. Extat etiam hæc obſervatio in deſcriptione hujus meridianæ a Caſſino, & Gulielmino edita Bononiæ 1695 pag. 54	41665 40620	22.37. 9 22. 6.27	22.37.30 22. 6.47	30.43	22.22. 9
Jun. 4		40901 39861	22.14.42 21.43.58	22.15. 2 21.44.18	30.44	21.59.40
Jun. 6	*Sole pallido*	40459 39425	22. 1.40 21.31. 0	22. 2. 0 21.31.19	30.41	21.46.39
Jun. 7	*Sole claro*	40264 39224	21.55.53 21.25. 2	21.56.13 21.25.22	30.51	21.40.47

Jun.

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 8	*Sole claro ſpecie tremula*	40078 39038	21.50.24 21.19.29	21.50.44 21.19.48	30.56	21.35.16
Jun. 9	*Sole claro*	39909 38872	21.45.23 21.14.33	21.45.43 21.14.52	30.51	21.30.17
Jun. 17	*Sole claro*	39032 38003	21.19.19 20.48.30	21.19.38 20.48.49	30.49	21. 4.13
Jun. 18	*Sole claro*, & conſentit MS. Uccelli	38986 37951	21.17.57 20.46.56	21.18.16 20.47.15	31. 1	21. 2.45
Jun. 19	*Sole claro* conſentit MS. Uccelli	38950 37916	21.16.52 20.45.53	21.17.11 20.46.12	30.59	21. 1.42
Jun. 20	In adverſ. tangentes incorrectæ 38973, 37847 *Sole claro*, unde correctæ 38923, 37897, ſed in libello ſupputationum poſtquam has ipſas tangentes conſignavit hæc notat: *eadem correcta per diligentiorem obſervationem factam a D. Uccello ſuper veſtigiis marginum ſolarium, & a me repetita die ſequenti* 38979, 37851; e quibus deducuntur tangentes correctæ quales in ſeriem retuli, & conſentit MS. Uccelli	38929 37901	21.16.14 20.45.26	21.16.33 20.45.45	30.48	21. 1. 9

Jun.

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 21	ex adverſ. Gul. *Sol haberi non potuit in meridie propter nubes, ſed cum pallidus appareret poſt merid., ejus ſpecie adhuc exiſtente in marmore orientali Solſtitii, notatus eſt uterque limbus, & per ſigna ductæ ſunt perpendiculares ad lineam, quæ dederunt tangentes meridianas; ſine errore autem poſſunt referri ſigna notata ad lineam, cum heri obſervaverim limbum percurrere diu lineam meridianæ perpendicularem.* Conſentit MS. Uccelli	38910 37919	21.15.40 20.45.59	21.15.59 20.46.18	29.41	21. 1. 9
Jun. 22	ex adverſ. Guliel. *Sole claro*	38938 37908	21.16.30 20.45.38	21.16.49 20.45.57	30.52	21. 1.23
Jun. 23	ibid. *Cælo nubilo ſpecie tremula*, & ſubdit: marmor tangentis majoris eſt humilius debito 7 particulis, ideoque corrigi debuit per ſubtractionem 3 particularum	38956 37922	21.17. 3 20.46. 5	21.17.22 20.46.24	30.58	21. 1.53
Jun. 24	*Sole pallido cælo nubiloſo*	38996 37965	21.18.15 20.47.21	21.18.35 20.47.40	30.55	21. 3. 7
Jun. 25	*Sole claro*	39043 38009	21.19.38 20.48.42	21.19.58 20.49. 1	30.57	21. 4.29
Jun. 26	*Sole claro*	39106 38070	21.21.31 20.50.30	21.21.50 20.50.49	31. 1	21. 6.19
Jun. 27	*Sole claro*	39185 38149	21.23.51 20.52.54	21.24.11 20.53.13	30.38	21. 8.32
Jul. 4	*Sole claro*	40111 39077	21.51.23 21.20.40	21.51.43 21.20.59	30.44	21.36.21

Jul.

1695		Tangentes corre ctæ a pe numbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera lim borum	Diam. app. Solis	Diſt. a vertice vera cen tri
		.	G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 5	ex libello ſupputationum Gul. *Sole ut ſupra*	40294 39257	21.56.48 21.26. 1	21.57. 8 21.26.21	30.47	21.41.45
Jul. 6	ex adverſ. *Sole pallido*	40497 39472	22. 2.48 21.32.24	22. 3. 8 21.32.44	30.24	21.47.56
Jul. 7	*Sole claro*	40718 39678	22. 9.20 21.38.32	22. 9.40 21.38.52	30.48	21.54.16
Jul. 9	*Sole claro*	41186 40147	22.23. 6 21.52.26	22.23.26 21.52.46	30.40	22. 8. 6
Jul. 11	*Sole claro*	41709 40665	22.38.26 22. 7.45	22.38.47 22. 8. 5	30.42	22.23.26
Jul. 13	*Sole claro.* Conſentit MS. Uccelli hoc, & ſequentibus diebus	42289 41233	22.55.23 22.24.28	22.55.44 22.24.48	30.56	22.40.16
Jul. 14	*Sole claro*	42600 41547	23. 4.26 22.33.42	23. 4.47 22.34. 3	30.44	22.49.25
Jul. 15	*Sole claro D. Uccellus*	42916 41863	23.13.39 22.42.56	23.14. 0 22.43.17	30.43	22.58.38
Jul. 16	*Sole claro D. Uccellus*	43260 42202	23.23.36 22.52.51	23.23.57 22.53.12	30.45	23. 8.34
Jul. 18	*Sole claro D. Uccellus*	43970 42900	23 44. 7 23.13.11	23.44.29 23.13.32	30.57	23.29. 0
Jul. 19	*Sole claro*	44347 43279	23.54.58 23.24.12	23.55.20 23.24.33	30.47	23.39.56
Jul. 20	*Sole clariſſimo*	44742 43668	24. 6.17 23.35.24	24. 6.39 23.36. 6	30.33	23.51.22
Jul. 22	*Sole clariſſimo ego cum D. Uccello*	45556 44467	24.29.31 23.58.24	24.29.53 23.58.44	31. 9	24.14.18
Jul. 23	*D. Uccellus*	45991 44909	24.41.53 24.11. 5	24.42.16 24.11.27	30.49	24.26.51

Jul.

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 24	*Sole claro ego cum D. Uccello*	46430 45339	24.54.21 24.23.21	24.54.44 24.23.43	31. 1	24.39.13
Jul. 25	*Sole claro Uccellus*	46891 45797	25. 7.21 24.36.23	25. 7.44 24.36.46	30.58	24.52.15
Jul. 28	*Sole claro*	48336 47236	25.47.50 25.17. 3	25.48.14 25.17.26	30.48	25.32.50
Jul. 30	*Sole claro*	49372 48250	26.16.36 25.45.26	26.17. 0 25.45.50	31.10	26. 1.25
Aug. 1	*Sole claro*	50451 49324	26.46.18 26.15.17	26.46.44 26.15.41	31. 3	26.31.12
Aug. 2	*Sole claro*	51018 49887	27. 1.48 26.30.48	27. 2.14 26.31.13	31. 1	26.46.43
Auſt. 3	*Sole claro*	51591 50451	27.17.23 26.46.18	27.17.49 26.46.43	31. 6	27. 2.16
Aug. 4	*Sole claro*	52176 51036	27.33.13 27. 2.17	27.33.40 27. 2.43	30.57	27.18.11
Aug. 5	*Sole claro*	52776 51632	27.49.24 27.18.30	27.49.51 27.18.56	30.55	27.34.23
Aug. 6	*Sole claro*	53393 52245	28. 5.56 27.35. 6	28. 6.23 27.35.33	30.50	27.50.58
Aug. 7	*Sole claro.* In MS. Uccelli limbus ſup. 52867	54020 52866	28.22.40 27.51.49	28.23. 7 27.52.16	30.51	28. 7.41
Aug. 9	*Sole claro*	55318 54148	28.57. 2 28.26. 5	28.57.30 28.26.32	30.58	28.42. 1
Aug. 12	*Sole pallidiuſculo ſpecie tremula*	57371 56178	29.50.37 29.19.37	29.51. 6 29.20. 5	31. 1	29.35.35
Aug. 13	*Sole pallido ſpecie tremula.* Sed in MS. Uccelli 58076, 56884	58078 56886	30. 8.51 29.38. 2	30. 9.20 29.38.31	30.49	29.53.55

Aug.

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 14	*Sole claro*	58808 57598	30.27.32 29.56.28	30.28. 1 29.56.57	31. 4	30.12.29
Aug. 16	ex adverſariis Guliel., & MS. Uccelli *Sole pallidiuſculo ſpecie tremula*	60287 59065	31. 5. 5 30.34. 6	31. 5.35 30.34.36	30.59	30.50. 5
Aug. 17	ex iiſdem utriſque *Sole claro*	61052 59831	31.24.18 30.53.33	31.24.49 30.54. 3	30.46	31. 9.26
Aug. 18	ex adverſ. Gul. *cælo nubilo ſpecie tremula incerta*. In MS. autem Uccelli limbus ſup. 60577	61844 60578	31.44. 3 31.12.24	31.44.35 31.12.54	31.41	31.28.44
Aug. 19	ex utriſque *Sole claro ec.*	62621 61369	32. 3.19 31.32.13	32. 3.51 41.32.44	31. 7	31.48.17
Aug. 20	*Sole claro*	63433 62176	32.23.18 31.52.18	32.23.50 31.52.50	31. 0	32. 8.20
Aug. 21	*Sole claro*	64240 62974	32.43. 0 32.12. 1	32.43.33 32.12.33	31. 0	32.28. 3
Aug. 23	ex adverſ. Gul. *Sole claro*	65924 64635	33.23.41 32.52.37	33.24.15 32.53.10	31. 5	33. 8.42
Aug. 24	*Sole claro*	66780 65482	33.44. 6 33.13. 4	33.44.41 33.13.37	31. 4	33.29. 9
Aug. 26	*Sole claro*	68548 67222	34.25.48 33.54.36	34.26.23 33.55.11	31.12	34.10.47
Aug. 27	*Sole claro*	69452 68115	34.46.52 34.15.39	34.47.28 34.16.14	31.14	34.31.51
Aug. 28	*Sole pallidiſſimo*	70352 69027	35. 7.38 34.36.58	35. 8.14 34.37.34	30.40	34.52.54
Aug. 29	*Sole claro*	71312 69950	35.29.37 34.58.23	35.30.13 34.58.59	31.14	35.14.36
Aug. 30	*Sole pallidiuſculo*	72264 70890	35.51.12 35.19.59	35.51.49 35.20.35	31.14	35.36.12

1695		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 2	*Sole pallidiſſimo ſpecie firma*	75197 73801	36.56.32 36.25.40	36.57.11 36.26.18	30.53	36.42.44
Sept. 4	*Sole claro.* Conſentiunt hodie & deinceps Uccelli MSS.	77239 75799	37.40.57 37. 9.44	37.41.37 37.10.23	31.14	37.26. 0
Sept. 5	*Sole claro*	78283 76830	38. 3.18 37.32. 6	38. 3.59 37.32.46	31.13	37.48.22
Sept. 6	*Sole claro*	79333 77869	38.25.35 37.54.29	38.26.17 37.55.10	31. 7	38.10.43
Sept. 8	*Sole claro*	81495 79992	39.10.43 38.39.25	39.11.26 38.40. 8	31.18	38.55.47
Sept. 9	*Sole pallido*	82594 81094	39.33.17 39. 2.24	39.34. 1 39. 3. 7	30.54	39.18.34
Sept. 10	*Sole claro*	83720 82190	39.56.10 39.25. 0	39.56.54 39.25.43	31.11	39.41.18
Sept. 12	*Sole in puncto meridie evaneſcente incertiſſima*	86011 84464	40.41.57 40.11. 9	40.42.43 40.11.53	30.50	40.27.18
Sept. 13	*Sole pallidiſſimo*	87147 85625	41. 4.16 40.34.19	41. 5. 2 40.35. 4	30.58	40.50.33
Sept. 14	*Sole claro*	88384 86778	41.28.17 40.57. 2	41.29. 3 40.57.48	31.15	41.13.25
Sept. 17	*Sole claro*	92057 90383	42.37.54 42. 6.27	42.38.42 42. 7.14	31.28	42.22.58
Sept. 21	*Sole pallido*	97220 95465	44.11.33 43.40.16	44.12.24 43.41. 6	31.18	43.56.45
Sept. 22	*Sole pallido*	98538 96768	44.34.42 44. 3.33	44.35.34 44. 4.24	31.10	44.19.59

Sept.

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 23	ex iiſdem utriſque *Sole claro* Hac nocte ex adverſ. Guliel. Luna appulit ad meridianum hora p. m. 12. 54. 41 horologii correcti. Tangentes in Gnomone D. Petronii incorrectæ 68886, 67476	99903 98083	44.58.21 44.26.44	44.59.13 44.27.35	31.38	44.43.24
Sept. 24	*Sole pallido*	101268 99437	45.21.40 44.50.18	45.22.13 44.51.10	31. 3	45. 6.41
Sept. 25	*Sole claro*	102667 100811	45.45.15 45.13.53	45.46. 9 45.14.45	31.24	45.30.27
Sept. 26	*Sole claro*	104070 102193	46. 8.34 45.37.17	46. 9.28 45.38.10	31.18	45.53.49
Sept. 27	*Sole claro*	105498 103592	46.31.59 46. 0.39	46.32.54 46. 1.33	31.21	46.17.13
Sept. 28	*Sole claro*	106965 105014	46.55.39 46.24. 4	46.56.35 46.24.59	31.36	46.40.47
Oct. 6	ex adverſ. Gul. *Sole pallido.* Limbi infer. tangens notatur in hiſce adverſariis incorr. 119331 cui ſubditur 119346; ſed in libello ſupputationum uſurpat ut veriorem 119346, quam propterea retinendam cenſui, eſtque correcta 119296	119296 117110	50. 1.43 49.30.23	50. 2.45 49.31.24	31.21	49.47. 4
Oct. 7	*Sole claro*	120950 118712	50.25. 0 49.53.25	50.26. 3 49.54.27	31.36	50.10.15
Oct. 8	*Sole claro*	122606 120333	50.47.55 50.16.21	50.48.59 50.17.23	31.36	50.33.11
Oct. 9	*Sole pallidiſſimo*	124280 121968	51.10.44 50.39. 8	51.11.48 50.40.11	31.37	50.55.59
Oct. 24	*Sole pallidiſſimo*	152066 149067	56.40.14 56. 8.41	56.41.35 56.10. 1	31.34	56.25.48

1695		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Oct. 28	*Sole claro, ſpecie tremula cum D. Caſſino*	160298 157025	58. 2.34 57.30.34	58. 4. 0 57.31.58	32. 2	57.47.59
Nov. 2		170935 167284	59.40.18 59. 7.47	59.41.51 59. 9.17	32.34	59.25.34
Nov. 7	*Sole claro*	181827 177906	61.11.26 60.39.36	61.13. 5 60.41.13	31.52	60.57. 9
Nov. 10	*Sole claro.* Hanc obſervationem a ſe cum Gulielmino habitam refert etiam Jacobus Caſſinus in itinere Italico quod extat in libro 7 monumentorum Regiæ Academiæ Pariſienſis, edito anno 1729	188484 184320	62. 3. 7 61.31. 8	62. 4.49 61.32.48	32. 1	61.48.48
Nov. 13	*Sole pallido*	195091 190744	62.51.40 62.20. 2	62.53.25 62.21.45	31.40	62.37.35
Nov. 16	*Sole claro*	201738 197100	63.37.58 63. 5.55	63.39.47 63. 7.41	32. 6	63.23.44
Nov. 17	*Sole claro*	203915 199206	63.52.36 63.20.38	63.54.26 63.22.25	32. 1	63.38.25
Nov. 18	*Sole claro*	206092 201286	64. 7. 0 63.34.54	64. 8.51 63.36.43	32. 8	63.52.47
Nov. 19	*D. Caſſinus. incerta*	208208 203362	64.20.44 63.48.54	64.22.37 63.50.45	31.52	64. 6.41
Nov. 21	*Sole claro*	212485 207451	64.47.51 64.15.51	64.49.47 64.17.43	32. 4	64.33.45
Nov. 22		214558 209435	65. 0.40 64.28.36	65. 2.37 64.30.30	32. 7	64.46.33
Nov. 24		218641 213368	65.25.20 64.53.20	65.27.19 64.55.17	32. 2	65.11.18

Dec.

1695		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Dec. 2	ex adverſ. Gul. *Sole claro*. Conſentit MS. Uccelli. Gulielminus porro in ſupputationibus addit minori tangenti particulas 100 ſubdens: *tangens minor correcta eſt additis* 100 *particulis, nam diameter foret nimis magna*	233535 227416	66.49.10 66.15.50	66.51.18 66.17.54	33.24	
Dec. 16	ex adverſ. Gul. *Sole pallido*. Tangens minor incorrecta eſt 242223, ſed illi ſubſcripta 242210 cum hac nota *verior*. Adjecta eſt etiam tangentium incorrectarū differentia 6628, quæ oſtendit Gulielminum hac poſtremam tangentem potiorem habuiſſe	248788 242260	68. 6. 9 67.34.12	68. 8.26 67.36.25	32. 1	67.52.25
Dec. 21	*Sole pallidiſſimo cælo nebuloſo*	250000 243480	68.11.55 67.40.17	68.14.11 67.42.30	31.41	67.58.20
Dec. 29	*Sole pallido cælo nubilo, ſed exacta quoad determinationem limborum*, & conſentit MS. Uccelli	246937 240443	67.57.14 67.25. 4	67.59.30 67.27.16	32.14	67.43.23
1696						
Jan. 1	ex adverſariis Guliel. *Sole pallido cælo nubilo, ſed ſatis exacta* in MS. Uccelli tangens limbi ſup. deficit ab hac particula una	244198 237821	67.43.51 67.11.38	67.46. 5 67.13.48	32.17	67.29.56
Jan. 7	ex iiſdem adverſ. *Sole claro*	236525 230510	67. 4.55 66.32.52	67. 7. 4 66.34.58	32. 6	66.51. 1
Jan. 9	ex iiſdem *Sole pallido*	233412 227512	66.48.30 66.16.22	66.50.37 66.18.26	32.11	66.34.31

Jan.

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
*Jan.*10	*Sole pallido*	231735 225939	66.39.31 66. 7.34	66.41.37 66. 9.37	32. 0	66.25.37
*Jan.*11	*Sole pallidiſſimo*	229997 224278	66.30. 4 65.58. 9	66.32.10 66. 0.12	31.58	66.16.11
*Jan.*13	*Sole claro*	226424 220819	66.10.17 65.38.10	66.12.21 65.40.10	32.11	65.56.15
*Jan.*15	*Sole clariſſimo exactiſſima*	222633 217197	65.48.43 65.16. 6	65.49.44 65.18. 5	31.39	65.33.54
*Jan.*18	*Sole claro*	216637 211444	65.13.23 64.41.20	65.15.22 64.43.15	32. 7	64.59.18
*Jan.*19	*Sole claro*	214566 209472	65. 0.43 64.28.50	65. 2.40 64.30.44	31.56	64.46.42
*Jan.*20	*Sole claro*	212476 207464	64.47.47 64.15.56	64.49.42 64.17.48	31.54	64.33.45
*Jan.*21	*Sole clariſſimo*	210363 205432	64.34.30 64. 2.39	64.36.24 64. 4.30	31.54	64.20.27
*Jan.*23	*Sole claro, ſpecie admodum tremula*	206091 201280	64. 6.59 63.34.51	64. 8.50 63.36.40	32.10	63.52.45
*Jan.*24	*Sole claro cælo ſereno ſpecie præter morem tremula*	203890 199197	63.52.26 63.20.34	63.54.16 63.22.22	31.54	63.38.19
*Jan.*26	*Sole claro ec.*	199532 194931	63.22.53 62.50.32	63.24.41 62.52.17	32.24	63. 8.29
*Jan.*27	*Sole claro* conſentit MS. Uccelli	197289 192811	63. 7.16 62.35.13	63. 9. 2 62.36.57	32. 5	62.52.59
*Jan.*28	*Sole claro exacta*	195041 190665	62.51.19 62.19.26	62.53. 4 62.21. 9	31.55	62.37. 6
*Jan.*29	*Sole claro.* Sed Uccellus dat limbum inf. 192835	192825 188498	62.35.19 62. 3.13	62.37. 3 62. 4.55	32. 8	62.20.59

Feb.

1696		Tangentes correctæ ape numbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 1	ex adverſariis Gulielmini. *Sole pallido*. Conſentiunt MSS. Uccelli	186128 182050	61.45. 9 61.13.13	61.46.49 61.14.52	31.57	61.30.50
Feb. 3	*Sole pallidiſſimo marginibus ſpeciei vix apparentibus*. Conſentit Uccellus	183917 179923	61.27.58 60.56. 6	61.29.38 60.57.44	31.54	61.13.41
Feb. 6	*Sole claro dubia* ex adverſ. Gulielmini	175238 171322	60.17.19 59.43.42	60.18.54 59.45.15	33.39	
Feb. 7	*Sole pallidiſſimo ut vix margines diſtinguerentur*	172830 169238	59.56.47 59.25.19	59.58.21 59.26.51	31.30	59.42.36
Feb. 8	*Sole claro*	170660 167112	59.37.53 59. 6.14	59.39.25 59. 7.44	31.41	59.23.34
Feb. 9	*Sole claro*	168513 165016	59.18.51 58.47. 3	59.20.22 58.48.32	31.50	59. 4.27
Feb. 12	*Sole claro*. Conſentit Uccellus in MS.	162110 158831	58.19.52 57.48.20	58.21.19 57.49.46	31.33	58. 5.32
Feb. 13	*Sole languidiſſimo*	160015 156714	57.59.50 57.27.29	58. 1.16 57.28.53	31.23	57.44.34
Feb. 14	*Sole languido*	157926 154724	57.39.28 57. 7.30	57.40.52 57. 8.52	32. 0	57.24.52
Feb. 19	*Sole claro*. Conſentit Uccellus	147773 144847	55.54.48 55.22.46	55.56. 7 55.24. 3	32. 4	55.40. 5
Feb. 21	ut ſupra	143840 141050	55.11.32 54.39.53	55.12.47 54.41. 7	31.40	54.56.57
Feb. 22	ut ſupra	141916 139184	54.49.48 54.18.15	54.51. 2 54.19.28	31.34	54.35.15
Feb. 23	ut ſupra	140018 137306	54.27.57 53.56. 3	54.29.10 53.57.15	31.55	54.13.12

1696		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 24	*Incerta*	138144 135627	54. 6. 0 53.35.54	54. 7.12 53.37. 5	30. 7	53.52. 8
Feb. 25	*Sole claro*. Conſentit deinceps Uccellus	136266 133649	53.43.36 53.11.43	53.44.47 53.12.53	31.54	53.28.50
Feb. 26	*Sole claro*	134413 131842	53.21. 7 52.49 14	53.22.18 52.50.23	31.55	53. 6.20
Feb. 27	*Sole claro*	132583 130067	52.58.30 52.26.45	52.59.40 52.27.53	31.47	52.43.46
Feb. 28	*Sole claro*	130792 128305	52.35.58 52. 4. 3	52.37. 7 52. 5.10	31.57	52.21. 8
Feb. 29	*Sole claro*	129005 126577	52.13. 6 51.41.25	52.14.14 51.42.31	31.43	51.58.22
Mar. 1	*Sole claro*	127257 124856	51.50.38 51.18.29	51.51.45 51.19.34	32.11	51.35.39
Mar. 2	*Sole claro ec.*	125520 123171	51.27.25 50.55.40	51.28.30 50.56.44	31.46	51.12.37
Mar. 4	*Sole claro*	122131 119832	50.41.23 50. 9.19	50.42.24 50.10.21	32. 3	50.26.22
Mar. 5	*Sole claro*	120445 118209	50.17.56 49.46.13	50.18.58 49.47.14	31.44	50. 3. 6
Mar. 6	*Sole claro*. Gul. habet pro limbo ſup. 116404. Sed Uccellus 116604, quod puto verius	118794 116604	49.54.34 49.23. 1	49.55.36 49.24. 2	31.34	49.39.49
Mar. 7	*Sole claro*	117172 115010	49.31.17 48.59.37	49.32.18 49. 0.37	31.41	49.16.27
Mar. 8	*Sole claro*	115577 113453	49. 7.59 48.36.23	49. 8.59 48.37.22	31.37	48.53.10
Mar. 9	*Sole claro*	113997 111906	48.44.32 48.12.57	48.45.32 48.13.55	31.37	48.29.43

Mar.

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 12	ex adverſariis Gulielmini. *Sole claro*	109391 107388	47.34. 5 47. 2.25	47.35. 2 47. 3.21	31.41	47.19.11
Mar. 13	*Sole claro*. Adverſ. Guliel. ſubdunt tangentes lunæ hac nocte obſervatas 55761, 54599, puto incorrectas	107881 105907	47.10.16 46.38.36	47.11. 2 46.39.31	31.31	46.55.16
Mar. 14	*Sole pallido*	106414 104472	46.46.47 46.15.11	46.47.42 46.16. 5	31.37	46.31.53
Mar. 18	*Sole pallido nubibus intercurrentibus, dubia*	100692 98849	45.11.52 44.40. 6	45.12.44 44.40.58	31.46	44.56.51
Mar. 19	*Sole claro, nebula rara ſpeciem intercurrente, ſed exacta*	99322 97508	44.48.19 44.16.38	44.49.11 44.17.29	31.42	44.33.20
Mar. 20	*Sole pallido, cælo nebuloſo incerta, quoniam ſumpta ſpecie exiſtente hinc inde a linea, nam in meridie Sol non apparuit*	97950 96165	44.24.24 43.52.48	44.25.15 43.53.39	31.36	44. 9.27
Mar. 25	*Sole pallido*	91450 89783	42.26.35 41.55. 7	42.27.23 41.55.54	31.29	42.11.38
Mar. 26	*Sole claro*	90214 88555	42. 3.18 41.31.36	42. 4. 5 41.32.23	31.42	41.48.14
Mar. 28	*Sole claro*	87764 86171	41.16.17 40.45. 8	41.17. 3 40.45.54	31. 9	41. 1.28
Mar. 30	*Sole pallido incerta eo quod Sol in meridie non apparuerit*	85377 83835	40.29.24 39.58.29	40.30. 9 39.59.13	30.56	40.14.41
Apr. 2	*Sole pallidiſſimo incerta*	81961 80488	39.20.19 38.49.48	39.21. 2 38.50.31	30.31	39. 6.46
Apr. 6	*Sole pallido cælo nubilo*	77653 76196	37.49.49 37.18.22	37.50.30 37.19. 2	31.28	37.34.46

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 13	*Sole pallido cælo nubilo ſpecie tremula*	70693 69347	35.15.28 34.44.25	35.16. 4 34.45. 1	31. 3	35. 0.32
Apr. 14	*Sole claro*	69770 68416	34.54.14 34.22.43	34.54.50 34.23.18	31.32	34.39. 4
Apr. 15	*Sole pallidiſſimo cælo nubilo.* In adverſariis ſic habet, ſubditque *dubia quoad tangentem minorem;* in libello autem ſupputationum conſignat hãc tangentem incorrectã 67451 quæ correcta foret 67501, & addit *dubia quoad limbum minorem.* Uccellus in MS. habet 67480 incorr., ſeu 67530 correct.	68824 67510	34.32.15 34. 1.24	34.32.51 34. 1.59	30.52	34.17.25
Apr. 20	*Sole pallido*	64494 63209	32.49.10 32.17.48	32.49.43 32.18.20	31.23	32.34. 1
Apr. 21	*Sole claro cælo nubilo ſpecie aliquatenus tremula, ſed exacta*	63670 62387	32.29. 6 31.57.31	32.29.38 31.58. 3	31.35	32.13.50
Apr. 23	*Sole claro*	62045 60800	31.49. 4 31.17.59	31.49.36 31.18.30	31. 6	31.34. 3
Apr. 24	*Sole pallido*	61265 60020	31.29.37 30.58.20	31.30. 7 30.58.50	31.17	31.14.28
Apr. 29	*Sole pallido cælo nubiloſo incerta quoniam facta Sole ad meridianum nondum appulſo, & centro ſpeciei intra marmora conſiſtente*	57537 56333	29.54.54 29.23.38	29.55.13 29.24. 6	31. 7	29.39.39
Apr. 30	*Sole clariſſimo.* Conſentit Uccellus	56828 55630	29.36.32 29. 5.14	29.37. 1 29. 5.42	31.19	29.21.21

Maj.

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 1	*Sole claro cælo nubilo incerta* Conſentit Uccellus	56142 54957	29.18.40 28.47.32	29.19. 8 28.48. 0	31. 8	29. 3.34
Maj. 2	*Sole claro cælo ſereno ſpecie tremula exacta.* Conſentit MS. Uccelli hodie & deinceps	55462 54283	29. 0.49 28.29.40	29. 1.17 28.30. 7	31.10	28.45.42
Maj. 3	*Sole claro*	54801 53619	28.43.24 28.12. 0	28.43.52 28.12.27	31.25	28.28. 9
Maj. 4	*Sole claro.* in adverſ. tangenti minori ſubſcripta eſt alia 7 particulis major, ſed in ſupputationibus hac utitur quam conſignavi & cum hac conſentit Uccellus	54146 52983	28.26. 2 27.54.58	28.26.29 27.55.25	31. 4	28.10.57
Maj. 5	*Sole claro*	53511 52355	28. 9. 6 27.38. 5	28. 9.33 27.38.32	31. 1	27.54. 2
Maj. 6	*Sole claro*	52892 51741	27.52.31 27.21.28	27.52.59 27.21.54	31. 5	27.37.26
Maj. 7	*Sole pallido, cælo nubilo ſpecie tremula*	52287 51136	27.36.14 27. 5. 0	27.36.41 27. 5.26	31.15	27.21. 3
Maj. 8	*Sole claro*	51684 50551	27.19.55 26.49. 2	27.20.21 26.49.28	30.53	27. 4.54
Maj. 9	*Sole claro*	51106 49974	27. 4.12 26.33.12	27. 4.38 26.33.37	31. 1	26.49. 7
Maj. 10	*Sole claro*	50538 49410	26.48.41 26.17.39	26.49. 7 26.18. 4	31. 3	26.33.35
Maj. 11	*Sole pallidiuſculo*	49991 48859	26.33.40 26. 2.24	26.34. 5 26. 2.48	31.17	26.18.26
Maj. 12	*Sole ut ſupra*	49451 48326	26.18.47 25.47.34	26.19.11 25.47.58	31.13	26. 3.34

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 13	Sole ut ſupra	48920 47806	26. 4. 6 25.33. 3	26. 4.30 25.33.27	31. 3	25.48.58
Maj. 14	Sole pallido	48408 47297	25.49.51 25.18.46	25.50.15 25.19.10	31. 5	25.34.42
Maj. 16	Sole claro	47421 46317	25.22.15 24.51. 9	25.22.38 24.51.32	31. 6	25. 7. 5
Maj. 17	Sole claro	46947 45850	25. 8.54 24.37.54	25. 9.17 24.38.17	31. 0	24.53.47
Maj. 18	Sole ut ſupra	46478 45390	24.55.40 24.24.48	24.56. 3 24.25.10	30.53	24.40.36
Maj. 19	Sole ut ſupra	46042 44956	24.43.21 24.12.25	20.43.44 24.12.47	30.57	24.28.15
Maj. 20	Incerta propter obſervatorem	45597 44522	24.30.42 24. 0. 0	24.31. 4 24. 0.22	30.42	24.15.43
Maj. 21	Sole pallidiſſimo	45178 44121	24.18.46 23.48.28	24.19. 8 23.48.50	30.18	24. 3.59
Maj. 22	Sole claro	4478[illegible] 4370[illegible]	24. 7.24 23.36.25	24. 7.46 23.36.47	30.59	23.52.16
Maj. 23	Sole ut ſupra	44386 43314	23.56. 5 23.25.10	23.56.27 23.25.31	30.56	23.40.59
Jun. 1	Sole claro	41465 40409	22.31.18 22. 0.12	22.31.39 22. 0.32	31. 7	22.16. 5
Jun. 2	Sole ut ſupra	41205 40160	22.23.39 21.52.50	22.23.59 21.53.10	30.49	22. 8.34
Jun. 3	Sole ut ſupra	40958 39914	22.16.23 21.45.32	22.16.43 21.45.52	30.51	22. 1.17
Jun. 4	Sole claro. Conſentit Uccellus	40732 39684	22. 9.44 21.38.42	22.10. 4 21.39. 2	31. 2	21.54.33
Jun. 5	Sole pallido	40507 39474	22. 3. 5 21.32.29	22. 3.25 21.32.48	30.37	21.48. 6

Jun.

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 6	ex adverſ. Guliel. *Sole claro* conſentit Uccellus ec.	40314 39275	21.57.23 21.26.32	21.57.43 21.26.51	31.52	21.42.47
Jun. 7	*Sole pallidiſſimo, & ſpecie vix apparente*	40114 39128	21.51.28 21.22.11	21.51.48 21.22.30	29.18	21.37. 9
Jun. 8	*Sole pallido, incerta quoniam ſumpta per normales extra lineam*	39950 38906	21.46.37 21.15.34	21.46.57 21.15.53	31. 4	21.31.25
Jun. 11	*Sole pallidiuſculo.* Guliel. ad majorem tangentem notat *incerta* ad minorem autem *verior*	39511 38463	21.33.35 21. 2.18	21.33.55 21. 2.37	30.18	21.17.46
Jun. 12	*Sole pallidiuſculo*	39367 38375	21.29.18 20.59.40	21.29.37 20.59.59	29.38	21.14.48
Jun. 14	*Sole claro*	39188 38158	21.23.58 20.53. 9	21.24.17 20.53.28	30.49	21. 9.12
Jun. 15	*Sole ut ſupra*	39114 38076	21.21.47 20.50.42	21.22. 6 20.51. 1	31. 5	21. 6.33
Jun. 16	*Sole ut ſupra*, & ſubdit *ego adfui abhinc*	39051 38006	21.19.52 20.48.36	21.20.11 20.48.55	31.16	21. 4.33
Jun. 17	*Sole ut ſupra*	38994 37957	21.18.11 20.47. 8	21.18.30 20.47.27	31. 3	21. 2.58
Jun. 18	*Sole pallidiſſimo dubia*	38959 37921	21.17. 9 20.46. 4	21.17.28 20.46.23	31. 5	21. 1.55
Jun. 20	*Sole claro cælo nubilo*	38920 37889	21.15.58 20.45. 5	21.16.17 20.45.24	30.53	21. 0.50
Jun. 21	*Sole claro, cælo ſereno, ſpecie tremula*	38930 37900	21.16.16 20.45.24	21.16.35 20.45.43	30.52	21. 1. 9
Jun. 22	*Sole ut ſupra*	38950 37915	21.16.52 20.45.51	21.17.11 20.46.10	31. 1	21. 1.40

Jun.

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 23	ex adverſ. Guliel. *Sole claro.* Conſentit MS. Uccelli	38991 37952	21.18. 6 20.46.58	21.18.25 20.47.17	31. 8	21. 2.51
Jun. 24	*Sole claro.* In MS. Uccelli utraque tangens minor eſt una particula	39037 37996	21.19.28 20.48.19	21.19.47 20.48.38	31. 9	21. 4.12
Jun. 26	*Sole claro*	39167 38132	21.23.20 20.52.23	21.23.39 20.52.42	30.57	21. 8.10
Jun. 27	*Sole pallidiſſimo*	39252 38229	21.25.51 20.55.18	21.26.10 20.55.37	30.33	21.10.54
Jun. 28	*Sole claro*	39366 38320	21.29.16 20.58. 0	21.29.35 20.58.19	31.16	21.13.57
Jun. 29	*Sole pallidiuſculo*	39472 38430	21.32.25 21. 1.19	21.32.44 21. 1.38	31. 6	21.17.11
Jun. 30	*Sole claro*	39603 38567	21.36.19 21. 5.25	21.36.38 21. 5.44	30.54	21.21.11
Jul. 3	*Sole claro*	40076 39028	21.50.21 21.19.12	21.50.41 21.19.31	31.10	21.35. 6
Jul. 4	*Sole claro*	40261 39220	21.55.50 21.24 54	21.56.10 21.25.13	30.57	21.40.41
Jul. 6	*Sole claro*	40661 39618	22. 7.38 21.36.46	22. 7.58 21.37. 5	30.53	21.52.31
Jul. 9	*Sole claro*	41380 40332	22.28.48 21.57.55	21.29. 8 21.58.15	31.53	22.14.11
Jul. 10	*Sole claro*	41651 40596	22.36.44 22. 5.43	22.37. 5 22. 6. 3	31. 2	22.21.34
Jul. 11	*Sole ut ſupra*	41928 40871	22.44.51 22.13.49	22.45.22 22.14. 9	31.13	22.29.45
Jul. 13	*Sole claro*	42525 41466	23. 2.16 22.31.19	23. 2.37 22.31.40	30.57	22.47. 8

Jul.

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 14	ex adverſ. Gul. *Sole claro*. Conſentit MS. Uccelli.	42847 41787	23.11.37 22.40.43	23.11.58 22.41. 4	30.54	22.56.31
Jul. 15	*Sole claro*	43186 42112	23.21.29 22.50.14	23.22.10 22.50.35	31.35	23. 6.22
Jul. 16	*Sole claro*	43533 42458	23.31.28 23. 0.19	23.31.49 23. 0.40	31. 9	23.16.14
Jul. 17	*Sole pallido*	43875 42823	23.41.22 23.10.55	23.41.44 23.11.16	30.28	23.26.30
Jul. 18	*Sole claro*	44257 43187	23.52.23 23.21.30	23.52.45 23.21.51	30.54	23.37.18
Jul. 19	*Sole ut ſupra*	44642 43570	24. 3.26 23.32.34	24. 3.48 23.32.56	30.52	23.48.22
Jul. 20	*Sole ut ſupra*	45045 43966	24.14.58 23.44. 0	24.15.20 23.44.22	30.58	23.59.51
Jul. 21	*Sole claro*	45457 44379	24.26.43 23.55.51	24.27. 5 23.56.13	30.52	24.11.19
Jul. 22	*Sole claro*	45882 44799	24.38.48 24. 7.55	24.39.11 24. 8.17	30.54	24.23.44
Jul. 23	*Sole pallidiuſculo cælo nebuloſo ſpecie firma*	46321 45239	24.51.15 24.20.29	24.51.38 24.20.51	30.47	24.36.15
Jul. 24	*Sole pallidiuſculo*	4677- 45687	25. 4. 7 24.33.15	25. 4.30 24.33.38	30.52	24.49. 4
Jul. 30	*Sole claro*	49775 48654	26.27.43 25.56.43	26.28. 7 27.57. 7	31. 0	26.12.37
Jul. 31	*Sole pallidiuſculo cælo nebuloſo ſpecie firma*	50317 49203	26.42.37 26.11.56	26.43. 3 26.12.20	30.43	26.27.41
Aug. 1	*Sole claro*	50880 49758	26.58. 1 26.27.15	26.58.27 26.27.40	30.47	26.43. 3

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Aug. 3	ex adverſ. Guliel. *Sole claro.* Conſentit MS. Uccelli	52037 50891	27.29.29 26.58.20	27.29.55 26.58.46	31. 9	27.14.20
Aug. 4	*Sole claro*	52638 51493	27.45.42 27.14.43	27.46. 9 27.15. 9	31. 0	27.30.39
Aug. 5	*Sole pallido*	53227 52101	28. 1.31 27.31.12	28. 1.58 27.31.39	30.19	27.46.48
Aug. 8	*Sole claro*	55166 53998	28.53. 2 28.22. 6	28.53.30 28.22.3[illegible]	30.57	28.38. 1
Aug. 9	*Sole claro*	55826 54652	29.10.23 28.39.28	29.10.51 28.39.56	30.55	28.55.23
Aug. 13	*Sole ut ſupra*	58617 57423	30.22.40 29.51.56	30.23. 9 29.52.25	0.44	30. 7.47
Aug. 14	*Sole ut ſupra*	59353 58144	30.41.26 30.10.31	30.41.5[illegible] 30.11. [illegible]	30.56	30.26.28
Aug. 15	*Sole claro*	60108 58885	31. 0.34 30.29.31	31. 1. 4 30.30. 0	31. 4	30.45.32
Aug. 17	*Sole claro*	61641 60401	31.39. 0 31. 7.57	31.39.32 31. 8.27	31. 5	31.23.59
Aug. 18	*Sole claro*	62426 61177	31.58.30 31.27.26	31.59. 2 31.27.57	31. 5	31.43.29
Aug. 19	*Sole claro*	63233 61973	32.18.24 31.47.17	32.18.56 31.47.49	31. 7	32. 3.22
Aug. 20	*Sole ut ſupra*	64044 62778	32.38.14 32. 7.12	32.38.47 32. 7.44	31. 3	32.23.15
Aug. 22	*Sole pallidiuſculo*	65720 64432	33.18.46 32.47.41	33.19.20 32.48.14	31. 6	33. 3.47
Aug. 23	*Sole ut ſupra*	66581 65280	33.39.22 33. 8.12	33.39.56 33. 8.45	31.11	33.24.20
Aug. 29	*Sole claro*	72036 70659	35.46. 3 35.14.41	35.46.40 35.15.17	31.23	35.31.58

Aug.

1696		Tangentes correctæ ape numbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 30	ex adverſ. Gul. *Sole claro*. Conſentit MS. Uccelli	72999 71612	36. 7.45 35.36.27	36. 8.22 35.37. 4	31.18	35.52.43
Aug. 31	*Sole ut ſupra*	73978 72579	36.29.36 35.58.19	36.30.14 35.58.56	31.18	36.14.35
Sept. 2	*Sole ut ſupra*	75972 74562	37.13.29 36.42.46	37.14. 8 36.43.25	30.43	36.58.47
Sept. 3	*Sole ut ſupra*	76991 75564	37.35.35 37. 4.34	37.36.15 37. 5.13	31. 2	37.20.44
Sept. 4	*Sole ut ſupra*	78027 76577	37.57.50 37.26.38	37.58.31 37.27.18	31.13	37.42.54
Sept. 5	*Sole claro*	79082 77622	38.20.16 37.49.10	38.20.57 37.49.50	31. 7	38. 5.23
Sept. 6	*Sole pallido*	80142 78684	38.42.34 38.11.50	38.43.16 38.12.31	30.45	38.27.53
Sept. 7	*Sole claro*	81232 79740	39. 5.15 38.34. 9	39. 5.58 38.34.51	31. 7	38.50.24
Sept. 8	*Sole claro*	82335 80815	39.25.57 38.56.36	39.26.40 38.57.19	29.21	39.11.59
Sept. 13	*Sole claro*	88087 86476	41.22.33 40.51. 7	41.23.19 40.51.53	31.26	41. 7.36
Sept. 14	*Sole claro D. Uccellus*	89275 87669	41.45.25 41.14.27	41.46.12 41.15.13	30.59	41.30.42
Sept. 15	*Sole claro*	90516 88860	42. 9. 0 41.37.28	42. 9.47 41.38.15	31.32	41.54. 1
Sept. 16	*Sole claro Bordonus*	91735 90080	42.31.54 42. 0.45	42.32.42 42. 1.32	31.10	42.17. 7
Sept. 17	*Sole ut ſupra*	92998 91306	42.55.20 42.23.53	42.56. 9 42.24.41	31.28	42.40.25
Sept. 18	*Sole claro*	94273 92569	43.18.41 42.47.24	43.19.30 42.48.12	31.18	43. 3.51

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 19	ex adverſ. Gul. *Sole pallido.* Conſentit MS. Uccelli	95574 93846	43.42. 9 43.10.54	43.42.59 43.11.43	31.16	43.27.21
Sept. 20	*Sole ut ſupra*	96886 95128	44. 5.39 43.34.11	44. 6.30 43.35. 1	31.29	43.50.45
Sept. 23	*Sole claro*	100933 99096	45.15.58 44.44.24	45.16.51 44.45.16	31.35	45. 1. 3
Sept. 24	*Sole claro*	102311 100465	45.39.16 45. 7.59	45.40. 9 45. 8.51	31.18	45.24.30
Sept. 29	*Sole claro*	109562 107562	47.36.53 47. 5.12	47.37.50 47. 6. 8	31.42	47.21.59
Sept. 30	*Sole claro.* quæ eadem poſtrema eſt in manuſcripto Uccelli obſervatio	111064 109040	48. 0. 3 47.28.35	48. 1. 1 47.29.32	31.29	47.45.16
Oct. 2	ex adverſ. Gul. *Sole claro*	114133 112055	48.46.34 48.15.14	48.47.34 48.16.12	31.22	48.31.53
Oct. 3	*Sole ut ſupra*	115700 113592	49. 9.47 48.38.29	49.10.47 48.39.28	31.19	48.55. 7
Oct. 5	*Sole pallidiuſculo*	118911 116722	49.56.15 49.24.44	49.58.17 49.25.44	32.33	49.42. 0
Oct. 6	*Sole pallidiſſimo*	120526 118343	50.19. 4 49.48. 8	50.20. 7 49.49. 9	30.58	50. 4.38
Oct. 11	*Sole pallidiuſculo ſpecie tremula*	129014 126614	52.13.11 51.41.54	52.14.19 51.43. 0	31.19	51.58.39
Oct. 13	*Sole claro*	132559 130050	52.58.12 52.26.32	52.59.22 52.27.40	31.42	52.43.31
Oct. 22	*Sole pallidiuſculo*	149583 146629	56.14.11 55.42.23	56.15.31 55.43.40	31.51	55.59.35
Oct. 23	*Sole ut ſupra*	151592 148588	56.35.19 56. 3.34	56.36.40 56. 4.53	31.47	56.20.46

Oct.

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 26	ex adverſ. Gul. *Sole claro*.	157697 154540	57.37.13 57. 5.38	57.38.37 57. 7. 0	31.37	52.22.48
Oct. 27	*Sole pallidiuſculo*	159775 156571	57.57.30 57.26. 4	57.58.56 57.27.28	31.28	57.43.12
*Nov.*2	*Sole claro*	172532 168947	59.54.12 59.22.43	59.55.46 59.24.14	31.32	59.40. 0
*Nov.*3	*Sole languido*	174854 171004	60.14. 5 59.40.54	60.15.40 59.42.27	33.13	
*Nov.*6	Hanc, & ſequentes obſervationes ad diem 2 Auguſti 1697, communicavit mihi ex propriis ſchedis Comes Albertus Graſſius poſtea Bononiæ Senator, qui cum Gulielmino obſervabat, me etiam interdum, necnon Gabriele fratre, & Stancario ſupplentibus, conſentiuntque cum Gulielmini adverſariis a me poſtmodum inſpectis	181276 177378	61. 7. 1 60.35.14	61. 8.39 60.36.50	31.49	60.52.44
*Nov.*8	*Cælo ſereniſſimo*. Hac nocte tangentes meridianæ ☽ 54792. 53513 incorrectæ a penumbra	185681 181660	61.41.34 61.10. 5	61.43.15 61.11.43	31.32	61.27.29
*Nov.*9	*Cælo ut ſupra*	187887 183779	61.58.35 61.26.53	62. 0.17 61.28.33	31.44	61.44.25
*Nov.*10	*ut ſupra*	190124 185932	62.15.24 61.43.38	62.17. 7 61.45.18	31.49	62. 1.12
*Nov.*12	*Sole claro ſpecie tremula*	194556 190224	62.47.51 62.16.10	62.49.36 62.17.53	31.43	62.33.44
*Nov.*13	*Sole claro ſpecie tremula*	196973 192353	63. 5. 2 62.31.52	63. 6.48 62.33.36	33.12	

1696		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
*Nov.*14	ex adverſ. Guliel. & ſchedis Co: Graſſij *Sole claro*	198998 194475	63.19.11 62.47.16	63.20.59 62.49. 1	31.58	63. 5. 0
*Nov.*15	*Sole languidiuſculo*	201187 196587	63.34.14 63. 2.18	63.36. 2 63. 4. 4	31.58	63.20. 3
*Nov.*16	*Sole ut ſupra*	203446 198814	63.49.28 63.17.55	63.51.18 63.19.43	31.35	63.35.30
*Nov.*19	*Sole languidiſſimo*	209847 204917	64.31.14 63.59.15	64.33. 8 64. 1. 6	31. 2	64.16.37
*Nov.*20	*Sole languido*	211964 206951	64.44.39 64.12.36	64.46.34 64.14.28	32. 6	64.30.31
*Nov.*21	*Sole claro*	214048 208956	64.57.32 64.25.32	64.59.29 64.27.26	32. 3	64.43.27
Dec. 8	*Sole languido*	242787 236478	67.36.51 67. 4.40	67.39. 4 67. 6.49	32.15	67.22.56
Dec. 10		244928 238518	67.47.26 67.15.14	67.49.40 67.17.24	32.16	67.33.32
Dec. 11		245868 239391	67.52. 2 67.19.49	67.54.17 67.22. 0	32.17	67.38. 8
Dec. 13		247434 240918	67.59.38 67.27.28	68. 1.54 67.29.40	31.14	67.45.17
Dec. 14	ad hanc diem notat Guliel. in adverſariis: *hucuſque D. Graſſius cum Manfredio*	248144 241518	68. 3. 4 67.30.29	68. 5.20 67.32.42	32.38	67.49. 1
1697						
*Jan.*1	Ex ſchedis Com. Graſſij, & Gulielm. adverſariis	243323 237025	67.39.36 67. 7.31	67.41.49 67. 9.40	32. 9	67.25.44
*Jan.*6	*Sole languidiſſimo*	236836 230762	67. 6.32 66.34.14	67. 8.41 66.36.20	32.21	66.52.30

Jan.

1697		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 14	ex ſchedis Com. Graſſij, & Gulielmini adverſariis *Sole languido*	223072 217669	65.51.25 65.19.31	65.53.27 65.21.30	31.57	65.37.28
Jan. 16	*Sole claro*	219175 213863	65.28.30 64.56.23	65.30.30 64.58.20	32.10	65.14.25
Jan. 17	*Sole claro*	217130 211911	65.16.17 64.44.15	65.18.16 64.46.10	32. 6	65. 2.13
Jan. 24	*languidiſſimo*	202232 197565	63.41.18 63. 9.12	63.43. 7 63.11. 0	32. 7	63.27. 3
Jan. 25	*Sole claro*	200027 195452	63.26.17 62.54.15	63.28. 5 62.56. 1	32. 4	63.12. 3
Jan. 27	*claro, cælo nubiloſo*	195583 191183	62.55.11 62.23.16	62.56.57 62.24.59	31.58	62.40.58
Jan. 29	*optima*	191084 186855	62.22.32 61.50.44	62.24.15 61.52.26	31.49	62. 8.20
Jan. 30	*Claro. obſervatio incerta*	188900 184704	62. 6.15 61.34. 7	62. 7.57 61.35.47	32.10	61.51.52
Feb. 1	*Sole optimo*	184426 180423	61.31.57 61. 0. 9	61.33.38 61. 1.47	31.51	61.17.42
Feb. 2	*Sole claro*	182212 178260	61.14.30 60.42.31	61.16. 9 60.44. 8	32. 1	61. 0. 8
Feb. 8	*languido*	166892 163435	59. 4.14 58.32.21	59. 5.44 58.33.49	31.55	58.49.46
Feb. 23	*optima*	138552 135899	54.10.49 53.39.11	54.12. 2 53.40.22	31.40	53.56.12
Feb. 24	*Sole claro*	136706 134082	53.48.53 53.17. 3	53.50. 4 53.18.1[illegible]	31.51	53.34. 8
Feb. 25	*Sole claro*	134839 132277	53.26.19 52.54.40	53.27.30 52.55.50	31.40	53.11.40

1697		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 26	ex ſchedis Co: Graſſij, & Guliel. adverſ. *Sole claro*	133002 130483	53. 3.42 52.32. 4	53. 4.52 52.33.13	31.39	52.49. 2
Feb. 27	*ut ſupra*	131193 128732	52.41. 2 52. 9.35	52.42.11 52.10.42	31.29	52.26.27
Feb. 28	*ſublanguido*	129420 126993	52.18.31 51.46.54	52.19.39 51.48. 0	31.39	52. 3.49
Mar. 1	*Sole claro*	127656 125260	51.55.36 51.23.54	51.56.43 51.24.59	31.44	51.40.51
Mar. 6	*optima*	119188 116984	50. 0.20 49.28.32	50. 1.22 49.29.33	31.49	49.45.27
Mar. 8	*claro*	115957 113825	49.13.34 48.41.58	49.14.34 48.42.58	31.36	48.58.46
Mar. 9	*claro dubia*	114381 112270	48.50.16 48.18.30	48.51.16 48.19.28	31.48	48.35.22
Mar. 10	*optimo*	112803 110730	48.26.36 47.54.54	48.27.35 47.55.52	31.43	48.11.43
Mar. 11	*cælo parum nubilo*	111278 109235	48. 3.20 47.31.38	48. 4.18 47.32.35	31.43	47.48.26
Mar. 12	*Sole languido*	109741 107730	47.39.33 47. 7.55	47.40.30 47. 9.51	30.39	47.25.10
Mar. 13	*optima*	108248 106256	47.16. 6 46.44.15	47.17. 2 46.45.11	31.51	47. 1. 6
Mar. 14	*optima*	106763 104808	46.52.25 46.20.41	46.53.21 46.21.35	31.46	46.37.28
Mar. 15	*Sole claro cælo nubilo*	105295 103381	46.28.39 45.57. 9	46.29.34 45.58. 3	31.31	46.13.48
Mar. 27	*ut ſupra*	89280 87632	41.45.32 41.13.44	41.46.19 41.14.30	31.49	41.30.24
Apr. 1	*Sole claro cælo ſereno*	83387 81832	39.49.26 39.17.39	39.50.10 39.18.22	31.48	39.34.16

Apr.

1697		Tangentes corre ctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 6	ex ſchedis Co: Graſſij, & Gulielmini adverſ. *Sole languidiſſimo*	77912 76469	37.55.22 37.25.17	37.56. 3 37.25.56	30. 7	37.40.59
Apr. 7	*Sole claro cælo nubilo*	76874 75437	37.33. 4 37. 2.42	37.33.44 37. 3.21	30.23	37.18.33
Apr. 12	*optima*	71892 70511	35.42.51 35.11.17	35.43.28 35.11.47	31.41	35.27.37
Apr. 13	*incerta*	70926 69568	35.20.47 34.49.43	35.21.23 34.50. 9	31.14	35. 5.46
Apr. 14	*Sole languido*	69973 68664	34.58.53 34.28.31	34.59.29 34.29. 6	30.23	34.44.17
Apr. 17	*Sole claro cælo nubilo ſpecie valde tremula*	67282 65953	33.56. 0 33.24.22	33.56.35 33.24.55	31.40	33.40.45
Apr. 18	*Sole languido*	66408 65095	33.35.15 33. 3.43	33.35.49 33. 4.16	31.33	33.20. 2
Apr. 24	*Sole claro cælo nubilo ſpecie tremula*	61452 60204	31.34.18 31. 3. 0	31.34.49 31. 3.30	31.19	31.19. 9
Apr. 26	*Cælo ſereno ſpecie tremula*	59916 58670	30.55.44 30.24. 0	30.56.14 30.24.29	31.45	30.40.21
Apr. 28	*Cælo ſubnubilo ſpecie tremula*	58420 57212	30.17.37 29.46.30	30.18. 6 29.46.59	31. 7	30. 2.32
Apr. 29	*Sole claro cælo ſubnubilo ſpecie tremula*	57709 56490	29.59.20 29.27.44	29.59.49 29.28.12	31.37	29.44. 0
Apr. 30	*Sole claro cælo ſereno ſpecie tremula*	57004 55793	29.41. 7 29. 9.32	29.41.36 29.10. 0	31.36	29.25.48
Maj. 2	*Sole languidiſſimo*	55622 54448	29. 5. 2 28.34. 3	29. 5.30 28.34.31	30.59	28.50. 0
Maj. 4	*Sole languido*	54312 53150	28.30.26 27.59.28	28.30.53 27.59.55	30.58	28.15.24

1697		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ' ''	Diſt. a vertice vera limborum G ' ''	Diam. app. Solis ' ''	Diſt. a vertice vera centri G ' ''
Maj. 7	ex ſchedis Co: Graſſij, & Guiielmini adverſariis *Sole claro cælo ſereno, ſpecie tremula*	52441 51278	27.40.23 27. 8.52	27.40.50 27. 9.18	31.32	27.25. 4
Maj. 8	*ut ſupra*	51834 50695	27.23.58 26.52.58	27.24.24 26.53.24	31. 0	27. 8.54
Maj. 9	*ut ſupra*	51251 50131	27. 8. 9 26.37.30	27. 8.35 26.37.55	30.40	26.53.15
Maj. 10	*ut ſupra*	50677 49543	26.52.29 26.21.20	26.52.54 26.21.45	31. 9	26.37.19
Maj. 11	*ut ſupra*	50129 48992	26.37.27 26. 6. 5	26.37.52 26. 6.29	31.23	26.22.10
Maj. 12	*ut ſupra*	49590 48458	26.22.37 25.51.15	26.23. 1 25.51.39	31.32	26. 7.25
Maj. 13	*ut ſupra*	49053 47931	26. 7.45 25.36.32	26. 8. 9 25.36.56	31.13	25.52.32
Maj. 14	*Cælo ut ſupra ſpecie maxime tremula*	48545 47416	25.53.40 25.22. 7	25.54. 4 25.22.30	31.34	25.38.17
Maj. 15	*ut ſupra*	48033 46921	25.39.24 25. 8.12	25.39.48 25. 8.35	31.13	25.24.11
Maj. 16	*ut ſupra*	47542 46430	25.25.39 24.54.21	25.26. 2 24.54.44	31.18	25.10.23
Maj. 18	*Sole claro cælo nubilo ſpecie tremula*	46599 45497	24.59. 7 24.27.51	24.59.30 24.28.13	31.17	24.43.51
Maj. 19	*ut ſupra*	41650 45057	24.46.24 24.15.18	24.46.47 24.15.40	31. 7	24.31.13
Maj. 20	*optima*	45707 44622	24.33.50 24. 2.51	24.34.13 24. 3.13	31. 0	24.18.43
Maj. 21	*Sole claro ect.*	45300 44196	24.22.14 23.50.37	24.22.36 23.50.59	31.37	24. 6.47

Maj.

1697		Tangentes correctæ ape numbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Maj. 22	ex ſchedis Co: Graſſij, & Gul. adverſ. *Sole languido*	44877 43800	24.10.10 23.39.13	24.10.32 23.39.35	30. 5	23.55. 4
Maj. 24	*Sole claro cælo ſereno ſpecie tremula*	44102 43022	23.47.55 23.16.43	23.48.17 23.17. 4	31.13	23.32.40
Maj. 25	*Sole claro cælo nubilo ſpecie tremula*	43734 42657	23.37.19 23. 6. 7	23.37.41 23. 6.28	31.13	23.22. 4
Maj. 26	*Sole clariſſimo ſpecie tremula*	43373 42301	23.26.53 22.55.44	23.27.14 22.56. 5	31. 9	23.11.39
Maj. 28	*Sole claro ſpecie tremula*	42705 41632	23. 7.30 22.36.11	23. 7.51 22.36.32	31.19	22.52.11
Maj. 29	*ut ſupra*	42393 41324	22.58.25 22 27. 9	22.58.46 22.27.29	31.17	22.43. 7
Jun. 2	*ut ſupra*	41267 40217	22.25.29 21.54.30	22.25.49 21.54.50	30.59	22.10.19
Jun. 3	*ut ſupra*	41020 39962	22.18.12 21.46.58	22.18.32 21.47.18	31.14	22. 2.55
Jun. 5	*ut ſupra*	40572 39520	22. 5. 0 21.33.49	22. 5. 0 21.34. 9	30.51	21.49.34
Jun. 6	*ut ſupra*	40363 39317	21.58.49 21.27.48	21.59. 9 21.28. 7	31. 2	21.43.38
Jun. 8	*Sole pallidiſſimo incerta*	39995 38936	21.47.56 21.16.27	21.48.16 21.16.46	31.30	21.32.31
Jun. 11	*Sole claro ſpecie tremula*	39540 38500	21.34.26 21. 3.27	21.34.46 21. 3.46	31. 0	21.19.16
Jun. 12	*Sole claro cælo nubilo*	39417 38375	21.30.43 20.59.40	21.31. 3 20.59.59	31. 4	21.15.31
Jun. 14	*cælo ſereno ſpecie maxime tremula*	39210 38172	21.24.37 20.53.35	21.24.56 20.53.54	31. 2	21. 9.25

1697		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
*Jun.*15	ex ſchedis Co: Graſſij, & Guliel. adverſ. *cælo ſereno ſpecie maxime tremula*	39129 38091	21.22.12 20.51. 9	21.22.31 20.51.28	31. 3	21. 6.59
*Jun.*16	*Sole languidiſſimo*	39068 38036	21.20.23 20.49.30	21.20.42 20.49.49	30.53	21. 5.15
*Jun.*17	*Sole claro ſpecie tremula*	39014 37971	21.18.46 20.47.27	21.19. 5 20.47.46	31.19	21. 3.15
*Jun.*19	*Sole languido*	38936 37897	21.16.26 20.45.18	21.16.46 20.45.38	31. 8	21. 1.12
*Jun.*20	*Sole claro cælo ſereno ſpecie tremula*	38934 37900	21.16.22 20.45.24	21.16.42 20.45.44	30.58	21. 1.13
*Jun.*21	*Sole claro cælo nubilo*	38930 37909	21.16.16 20.45.39	21.16.35 20.45.58	30.37	21. 1.17
*Jun.*22	*ut ſupra, & ſpecie tremula*	38945 37912	21.16.44 20.45.48	21.17. 3 20.46. 7	30.56	21. 1.35
*Jun.*23	*ut ſupra*	38978 37940	21.17.44 20.46.37	21.18. 3 20.46.56	31. 7	21. 2.29
*Jun.*24	*ut ſupra*	39014 37983	21.18.47 20.47.52	21.19.16 20.48.11	31. 5	21. 3.43
*Jun.*25	*ut ſupra*	39073 38040	21.20.39 20.49.38	21.20.58 20.49.57	31. 1	21. 5.27
*Jun.*26	*ut ſupra*	39153 38108	21.22.54 20.51.40	21.23.13 20.51.59	31.14	21. 7.36
*Jun.*27	*Sole languido*	39227 38189	21.25. 8 20.54. 6	21.25.27 20.54.25	31. 2	21. 9.56
*Jun.*28	*Sole claro cælo nubilo ſpecie tremula*	39334 38292	21.28.20 20.57.11	21.28.39 20.57.30	31. 9	21.13. 4
*Jun.*29	*ut ſupra, ſed cælo ſereno*	39450 38405	21.31.45 21. 0.35	21.32. 5 21. 0.54	31.11	21.16.29

Jun.

1697		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 30	ex ſchedis Co: Graſſij, & Gulielmini adverſ. *Sole claro cælo nubilo*	39579 38545	21.35.37 21. 4.45	21.35.57 21. 5. 4	30.53	21.20.30
Jul. 2	*Sole languido*	39866 38820	21.44. 8 21.13. 0	21.44.28 21.13.19	31. 9	21.28.53
Jul. 3	*Sole languido incerta*	40033 38997	21.49. 4 21.18.17	21.49.24 21.18.36	30.48	21.34. 0
Jul. 4	*Sole claro cælo nubilo ſpecie tremula*	40218 39164	21.54.33 21.23.14	21.54.53 21.23.33	31.20	21.39.13
Jul. 6	*ut ſupra*	40616 39567	22. 6.19 21.35.15	22. 6.39 21.35.35	31. 4	21.51. 7
Jul. 7	*ut ſupra*	40835 39785	22.12.46 21.41.43	22.13. 6 21.42. 3	31. 3	21.57.34
Jul. 8	*Cælo ſereno ſpecie tremula*	41071 40015	22.19.44 21.48.32	22.20. 4 21.48.52	31.12	22. 4.28
Jul. 9	*Sole clariuſculo cælo nebuloſo*	41323 40274	22.27. 7 21.56.12	22.27.27 21.56.32	30.55	22.11.59
Jul. 10	*Sole claro cælo nebuloſo ſpecie tremula*	41583 40530	22.34.45 22. 3.45	22.35. 6 22. 4. 5	31. 1	22.19.35
Jul. 11	*ut ſupra*	41862 40815	22.42.55 22.12.11	22.42.16 22.12.31	29.45	22.27.23
Jul. 12	*Sole optimo ſpecie tremula*	42150 41094	22.51.20 22.20.23	22.51.41 22.20.43	30.58	22.36.12
Jul. 13	*Sole languido*	42446 41397	22.59.58 22.29.17	23. 0.19 22.29.37	30.42	22.44.58
Jul. 16	*Sole claro cælo nubilo*	43445 42370	23.28.58 22.57.45	23.29.19 22.58. 6	31.13	23.13.42
Jul. 17	*ut ſupra*	43795 42730	23.39. 5 23. 8.14	23.39.27 23. 8.35	30.52	23.24. 1

1697		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jul. 20	ex ſchedis Co: Graſſij, & adverſ. Guliel. *Sole claro cælo nubilo*	44946 43867	24.12. 7 23.41. 9	24.12.29 23.41.31	30.58	23.57. 0
Jul. 21	*ut ſupra*	45355 44270	24.23.48 23.52.45	24.24.10 23.53. 7	31. 3	24. 8.38
Jul. 22	*Sole clariuſculo*	45772 44689	24.35.40 24. 4.46	24.36. 3 24. 5. 8	30.55	24.20.35
Jul. 23	*ut ſupra*	46218 45124	24.48.21 24.17.13	24.48.44 24.17.35	31. 9	24.33. 9
Jul. 24	*Sole clariſſimo, & maxime tremulo*	46659 45570	25. 0.48 24.29.55	25. 1.11 24.30.17	30.54	24.46.44
Jul. 25	*clariſſimo*	47127 46025	25.13.59 24.42.51	25.14.22 24.43.14	31. 8	24.58.48
Jul. 26	*ut ſupra*	47607 46502	25.27.28 24.56.22	25.27.51 24.56.45	31. 6	25.12.18
Jul. 27	*ut ſupra cælo nubilo*	48098 46989	25.41.12 25.10. 7	25.41.36 25.10.30	31. 6	25.26. 3
Jul. 29	*ut ſupra*	49113 47998	26. 9.25 25.38.25	26. 9.49 25.38.49	31. 0	25.54.19
Jul. 30	*ut ſupra*	49642 48523	26.24. 3 25.53. 3	26.24.28 25.53.27	31. 1	26. 8.57
Jul. 31	*ut ſupra*	50187 49050	26.39. 3 26. 7.40	26.39.28 26. 8. 4	31.24	26.23.46
Aug. 1	*ut ſupra*	50735 49606	26.54. 4 26.23. 4	26.54.30 26.23.29	31. 1	26.38.59
Aug. 2	*ut ſupra*	51314 50163	27. 9.51 26.38.24	27.10.17 26.38.49	31.28	26.54.33

1697		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
	Deinceps obſervationes omnes ſive a me ipſo, ſive ab aliis habitæ, depromptæ ſunt ex meis adverſariis, quæ conſcribere cæpi die 3. Auguſti 1697					
Aug. 3	Sole claro cælo ſereno	51890 50747	27.25.29 26.54.23	27.25.55 26.54.49	31. 6	27.10.22
Aug. 4	ut ſupra	52481 51337	27.41.28 27.10.29	27.41.55 27.10.55	31. 0	27.26.25
Aug. 5	ut ſupra	53102 51933	27.58.10 27.26.39	27.58.37 27.27. 5	31.32	27.42.51
Aug. 6	Sole languido	53722 52557	28.14.45 27.43.31	28.15.12 27.43.58	31.14	27.59.35
Aug. 8	Sole languido	55004 53831	28.48.46 28.17.39	28.49.14 28.18. 6	31. 8	28.33.40
Aug. 9	ut ſupra	55664 54472	29. 6. 8 28.34.41	29. 6.36 28.35. 9	31.33	28.50.55
Aug. 10	ut ſupra	56345 55150	29.23.58 28.52.37	29.24.26 28.53. 5	31.21	29. 8.45
Aug. 11	ut ſupra	57033 55829	29.41.52 29.10.27	29.42.21 29.10.55	31.26	29.26.38
Aug. 12	Sole claro	57737 56530	30. 0. 2 29.28.47	30. 0.31 29.29.15	31.16	29.44.53
Aug. 13	Sole claro	58548 57237	30.20.54 29.47. 8	30.21.23 29.47.37	33.46	
Aug. 14	Sole languido	59186 57956	30.37.11 30. 5.44	30.37.41 30. 6.13	31.28	30.21.57
Aug. 15	Sole claro	59925 58695	30.55.57 30.24.38	30.56.27 30.25. 7	31.20	30.40.47

Aug.

1697		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 16	Sole claro	60684 59445	31.15. 4 30.43.46	31.15.34 30.44.16	31.18	30.59.55
Aug. 17	Sole claro	61455 60209	31.34.22 31. 3. 6	31.34.53 31. 3.36	31.17	31.19.14
Aug. 18	Sole languido	62237 60984	31.53.49 31.22.36	31.54.21 31.23. 7	31.14	31.38.44
Aug. 19	Sole languido	63037 61777	30.13.34 31.42.25	32.14. 6 31.42.56	31.10	31.58.31
Aug. 21	Sole claro	64663 63392	32.53.16 32.22.18	32.53.49 32.22.50	30.59	32.38.20
Aug. 22	Sole claro	65516 64215	33.13.53 32.42.24	33.14.26 32.42.57	31.29	32.58.41
Aug. 23	Sole claro	66370 65061	33.34.20 33. 2.54	33.34.54 33. 3.27	31.27	33.19.10
Aug. 25	Sole clariſſimo	68116 66795	34.15.40 33.44.27	34.16.15 33.45. 1	31.14	34. 0.38
Aug. 26	Sole clariſſimo	69011 67682	34.36.37 34. 5.27	34.37.13 34. 6. 2	31.11	34.21.37
Aug. 27	Sole clariſſimo ſpecie tremula	69933 68575	34.57.59 34.26.25	34.58.35 34.27. 0	31.35	34.42.47
Aug. 28	Sole clariſſimo	70856 69498	35.19.11 34.47.54	35.19.47 34.48.29	31.18	35. 4. 8
Aug. 29	Sole claro cælo nubilo	71803 70425	35.40.46 35. 9.19	35.41.23 35. 9.55	31.28	35.25.39
Aug. 30	clariſſimo	72761 71370	36. 2.24 35.30.57	36. 3. 1 35.31. 3	31.58	35.47. 2
Aug. 31	obſervatio dubia	73702 72328	36.23.28 35.52.40	36.24. 5 35.53.17	30.48	36. 8.41
Sept. 1	Sole claro cælo ſereno ſpecie tremula	74723 73306	36.46. 6 36.14.37	36.46.45 36.15.14	31.31	36.30.59

1697		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 2	Sole claro cælo nubilo	75717 74300	37. 7.57 36.36.45	37. 8.36 36.37.23	31.13	36.52.59
Sept. 3	ut ſupra	76729 75299	37.29.57 36.58.46	37.30.37 36.59.25	31.12	37.15. 1
Sept. 4	Sole clariſſimo	77764 76314	37.52.13 37.20.57	37.52.54 37.21.37	31.17	37.37.15
Sept. 5	ut ſupra	78822 77344	38.14.46 37.43.12	38.15.27 37.43.53	31.34	37.59.40
Sept. 6	ut ſupra	79877 78393	38.37. 0 38. 5.39	38.37.42 38. 6.20	31.22	38.22. 1
Sept. 7	Sole claro cælo nubilo	80964 79459	38.59.43 38.28.14	39. 0.26 38.28.56	31.30	38.44.41
Sept. 8	clariſſimo	82051 80536	39.22. 9 38.50.48	39.22.52 38.51.31	31.21	39. 7.11
Sept. 9	clariſſimo	83181 81640	39.45.15 39.13.42	39.45.59 39.14.26	31.33	39.30.12
Sept. 10	Sole languido	84285 82753	40. 7.34 39.36.32	40. 8.18 39.37.16	31. 2	39.52.47
Sept. 12	Sole languido	86615 85023	40.53.52 40.22.21	40.54.38 40.23. 5	31.33	40.38.51
Sept. 13	Sole claro cælo nubilo	87797 86188	41.16.57 40.45.27	41.17.43 40.46.13	31.30	41. 1.58
Sept. 14	Sole languido	88992 87370	41.40. 0 41. 8.38	41.40.47 41. 9.24	31.23	41.25. 5
Sept. 16	claro, cælo ſubnubilo	91447 89788	42.26.31 41.55.12	42.27.19 41.55.59	31.20	42.11.39
Sept. 17	clariſſimo	92697 91015	42.49.47 42.18.23	42.50.35 42.19.10	31.25	42.34.53
Sept. 18	languido	93965 92269	43.13. 4 42.41.53	43.13.53 42.42.41	31.12	42.58.17

1697		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Sept. 22	Sole claro cælo nubilo	99237 97433	44.46.49 44.15.18	44.47.41 44.16. 9	31.32	44.31.55
Sept. 23	Sole languido	100593 98778	45.10.10 44.38.53	45.11. 2 44.39.45	31.17	44.55.23
Sept. 25	Sole languido	103387 101513	45.57.15 45.25.48	45.58. 9 45.26.41	31.28	45.42.25
Sept. 27	Sole clariſſimo ſpecie tremula	106244 104312	46.44. 3 46.12.33	46.44.59 46.13.27	31.32	46.29.13
Sept. 28	ut ſupra	107703 105742	47. 7.26 46.35.55	47. 8.22 46.36.50	31.32	46.52.36
Sept. 30	Sole claro cælo nubilo	110707 108674	47.54.32 47.22.49	47.55.30 47.23.46	31.44	47.39.38
Oct. 1	Sole languidiſſimo	112202 100184	48.17.28 47.46.26	48.18.27 47.47.23	31. 4	48. 2.55
Oct. 2	Sole clariſſimo	113771 111680	48.41. 9 48. 9.30	48.42. 9 48.10.28	31.41	48.26.18
Oct. 3	ut ſupra	115313 113215	49. 4. 4 48.32.48	49. 5. 4 48.33.47	31.17	48.49.26
Oct. 8	Sole claro cælo nubilo	123447 121157	50.59.25 50.27.52	51. 0.29 50.28.55	31.34	50.44.42
Oct. 17	ut ſupra	139478 136801	54.21.40 53.50. 1	54.22.53 53.51.13	31.40	54. 7. 3
Oct. 19	clariſſimo	143270 140500	55. 5. 8 54.33.32	55. 6.23 54.34.46	31.37	54.50.34
Oct. 21	Sole languido	147128 144245	55.47.48 55.16. 4	55.49. 6 55.17.20	31.46	55.33.13
Oct. 22	Sole claro cælo ſubnubilo	149097 146168	56. 9. 0 55.37.30	56.10.19 55.38.37	31.42	55.54.28
Oct. 23	ut ſupra	151103 148120	56.30.13 55.58.32	56.31.33 55.59.51	31.42	56.15.42

Oct.

1697		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 29	ut ſupra. Hac nocte Tangentes lunæ in meridiana incorrectæ 61239, 59839	163453 160129	58.32.31 58. 0.56	58.33.59 52. 2.12	31.47	58.18. 5
Oct. 30	Sole claro	165547 162156	58.51.56 58.20.17	58.53.26 58.21.44	31.42	58.37.35
Oct. 31	Sole clariſſimo	167665 164198	59.11.14 58.39.28	59.12.45 58.40.56	31.49	58.56.50
Nov. 4	Sole claro	176350 172590	60.26.40 59.54.42	60.28.16 59.56.16	32. 0	60.12.16
Nov. 5	nebuloſo	178532 174718	60.44.45 60.12.55	60.46.22 60.14.30	31.52	60.30.26
Nov. 6	Sole ſublanguido	180738 176846	61. 2.46 60.30.48	61. 4.24 60.32.24	32. 0	60.48.24
Nov. 7	clariſſimo	182944 178990	61.20.18 60.48.30	61.21.57 60.50. 7	31.50	61. 6. 2
Nov. 8	languidiſſimo	185139 181132	61.37.30 61. 5.52	61.39.10 61. 7.30	31.40	61.23.20
Nov. 9	claro	187362 183253	61.54.36 61.22.44	61.56.18 61.24.23	31.55	61.40.20
Nov. 10	claro	189594 185393	62.11.28 61.39.28	62.13.11 61.41. 8	32. 3	61.57. 9
Nov. 11	clariſſimo	191788 187529	62.27.44 61.55.53	62.29.28 61.57.35	31.53	62.13.31
Nov. 13	clariſſimo ſpecie valde tremula cælo nubilo	196226 191791	62.59.45 62.27.45	63. 1.31 62.29.29	32. 2	62.45.30
Nov. 14	Sole languido	198409 193939	63.15. 6 62.43.24	63.16.53 62.45. 9	31.44	63. 1. 1
Nov. 15	Sole claro	200636 196045	63.30.28 62.58.28	63.32.16 63. 0.14	32. 2	63.16.15

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1697			G ′ ″	G ′ ″	′ ″	G ′ ″
Nov. 16	Sole claro cælo nubilo	202804 198163	63.45.10 63.13.23	63.47. 0 63.15.10	31.50	63.31. 5
Nov. 21	Sole claro cælo ſubnubilo	213929 208466	64.56.48 64.22.24	64.58.45 64.24.17	34.28	
Dec. 10	Sole claro cælo ſereno	244654 238270	67.46. 5 67.13.58	67.48.20 67.16. 9	32.11	67.32.14
Dec. 14	Sole languidiſſimo	247864 241434	68. 1.41 67.30. 4	68. 3.57 67.32.17	31.40	67.48. 7
Dec. 15	Sole claro cælo nubilo ſpecie tremula	248499 241995	68. 4.46 67.32.53	68. 7. 2 67.35. 6	31.56	67.51. 4
Dec. 17	Sole clariſſimo	249391 242808	68. 9. 1 67.36.57	68.11.18 67.39.10	32. 8	67.55.14
Dec. 19	ut ſupra	249900 243270	68.11.26 67.39.14	68.13.43 67.41.29	32.14	67.57.36
Dec. 20	Sole clariſſimo cælo ſub nubilo, ſpecie tremula	250014 243386	68.11.59 67.39.49	68.14.16 67.42. 2	32.14	67.58. 9
1698						
Jan. 2	Sole clariſſimo	242509 236224	67.35.27 67. 3.21	67.37.40 67. 5.30	32.10	67.21.35
Jan. 3	Sole clariſſimo	241286 235080	67.29.19 66.57.20	67.31.31 66.59.29	32. 2	67.15.30
Jan. 6	Sole languido	237227 231169	67. 8.34 66.36.27	67.10.44 66.38.33	32.11	66.54.39
Jan. 7	Sole languido	235725 229762	67. 0.44 66.28.47	67. 2.53 66.30.53	32. 0	66.46.53
Jan. 9	Sole clariſſ. cælo nubilo	232525 226692	66.43.46 66.11.47	66.45.52 66.13.51	32. 1	66.29.51
Jan. 25	Sole clariſſimo	200544 195969	63.29.50 62.57.56	63.31.38 62.59.42	31.56	63.15.40

Feb.

1698		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 3	ut ſupra	180528 176648	61. 0.51 60.29. 7	61. 2.29 60.30.43	31.46	60.46.36
Feb. 10	Sole claro cælo ſubnubilo	165262 161864	58.49.19 58.17.31	58.50.48 58.18.48	32. 0	58.34.48
Feb. 11	Sole clariſſimo	163124 159801	58.29.25 57.57.45	58.30.53 57.59.11	31.42	58.15. 2
Feb. 13	Sole pallido	158927 155696	57.49.16 57.17.18	57.50.41 57.18.41	32. 0	57.34.41
Feb. 18	Sole pallido	148690 145777	56. 4.39 55.33. 3	56. 5.58 55.34.21	31.37	55.50. 9
Feb. 20	Sole clariſſimo	144743 141946	55.21.37 54.50. 8	55.22.53 54.51.23	31.30	55. 7. 8
Feb. 21	Sole claro	142814 140064	55. 0. 0 54.28.29	55. 1.15 54.29.42	31.33	54.45.29
Mar. 3	Sole pallido	124610 122299	51.15.10 50.43.42	51.16.15 50.44.46	31.29	51. 0.30
Mar. 5	Sole claro ſpecie tremula	121232 118990	50.28.55 49.57.22	50.29.59 49.58.25	31.34	50.14.12
Mar. 6	Sole clariſſimo	119577 117366	50. 5.41 49.34. 4	50. 6.44 49.35. 6	31.38	49.50.55
Mar. 7	Sole claro ſpecie tremula	117963 115770	49.42.40 49.10.49	49.43.42 49.11.50	31.52	49.27.46
Mar. 8	ut ſupra	116335 114194	49.19. 5 48.47.29	49.20. 6 48.48.29	31.37	49. 4.17
Mar. 9	ut ſupra	114743 112629	48.55.39 48.23.56	48.56.39 48.24.55	31.44	48.40.47
Mar. 10	ut ſupra	113187 111111	48.32.23 48. 0.46	48.33.22 48. 1.44	31.38	48.17.33
Mar. 11	claro cælo nubilo	111625 109592	48. 8.39 47.37.13	48. 9.37 47.38.10	31.27	47.53.53

1698		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 16	ut ſupra	104202 102297	46.10.44 45.39. 2	46.11.38 45.39.55	31.43	45.55.46
Mar. 21	Sole pallidiſſimo. Hac nocte Tangentes Lunæ in meridiana 61192, 59926 incor rectæ	97263 95492	44.12.18 43.40.45	44.13. 9 43.41.36	31.33	43.57.23
Mar. 22	Sole claro cælo nubilo. Tangentes merid. Lunæ incorr. 69458, 68085	95959 94172	43.49. 8 43.16.51	43.49.59 43.17.41	32.18	43.33.50
Mar. 23	ut ſupra	94624 92900	43.25. 4 42.53.31	43.25.53 42.54.20	31.33	43.10. 6
Mar. 24	Sole clariſſimo	93329 91624	43. 1.25 42.29.50	43. 2.14 42.30.38	31.36	42.46.26
Mar. 25	Sole claro cælo nubilo	92068 90382	42.38. 7 42. 6.28	42.38.55 42. 7.15	31.40	42.23. 5
Mar. 26	Sole pallido	90803 89153	42.14.25 41.43. 5	42.15.12 41.43.51	31.21	41.59.31
Mar. 27	Sole clariſſimo	89572 87936	41.51. 6 41.19.38	41.51.53 41.20.24	31.29	41.36. 8
Mar. 29	Sole claro cælo ſubnubilo	87167 85550	41. 4.40 40.32.49	41. 5.26 40.33.34	31.52	40.49.30
Mar. 30	Sole clariſſimo ſpecie tremula	85973 84390	40.41.12 40. 9.40	40.41.57 40.10.24	31.33	40.26.10
Mar. 31	ut ſupra	84811 83251	40.18. 6 39.46.40	40.18.50 39.47.24	31.26	40. 3. 7
Apr. 1	Sole claro ſpecie tremula	83661 82115	39.54.59 39.23.16	39.55.43 39.23.59	31.44	39.39.51
Apr. 2	ut ſupra	82539 81003	39.32.10 39. 0.31	39.32.54 39. 1.14	31.40	39.17. 4

Apr.

1698		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 3	Sole languidiſſimo	81409 79920	39. 8.55 38.37.55	39. 9.38 38.38.38	31. 0	38.54. 8
Apr. 4	Sole clariſſimo	80223 78818	38.46.21 38.14.40	38.47. 4 38.15.21	31.43	38.31.12
Apr. 5	ut ſupra	79249 77758	38.23.47 37.52. 5	38.24.29 37.52.46	31.43	38. 8.37
Apr. 6	clariſſimo, ſpecie tremula	78181 76714	38. 1. 8 37.29.36	38. 1.49 37.30.16	31.33	37.46. 2
Apr. 7	ut ſupra	77128 75683	37.38.33 37. 7.10	37.39.13 37. 7.49	31.24	37.23.31
Apr. 9	ut ſupra	75090 73661	36.54.10 36.22.33	36.54.49 36.23.11	31.38	36.39. 0
Apr. 16	Inter nubes. Hac nocte Tangentes meridianæ Lunæ incorrectæ 76413, 74980	68385 67059	34.21.59 33.50.43	34.22.34 33.51.18	31.16	34. 6.56
Apr. 20	Sole claro	64896 63608	32.58.56 32.27.35	32.59.29 32.28. 7	31.22	32.43.48
Apr. 21	ut ſupra. Hac nocte centrum ☽ in meridiana h. 9. 37 4. p.m. Tangentes incorrectæ 101388, 99610	64070 62780	32.38.51 32. 7.15	32.39.24 32. 7.47	31.37	32.23.35
Apr. 22	Sole nebuloſo	63248 61975	32.18.45 31.47.19	32.19.17 31.47.51	31.26	32. 3.34
Apr. 24	Sole languido	61639 60390	31.38.57 31. 7.40	31.39.28 31. 8.10	31.18	31.23.49
Apr. 28	ut ſupra	58608 57392	30.22.25 29.51. 9	30.22.54 29.51.38	31.16	30. 7.16
Apr. 29	Sole languidiſſimo	57859 56709	30. 3.12 29.33.25	30. 3.41 29.33.54	29.47	29.48.48

Apr.

1698		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Apr. 30	Sole claro ſpecie tremula	57179 55965	29.45.38 29.14. 1	29.46. 7 29.14.29	31.38	29.30.18
Maj. 1	Sole clariſſimo ſpecie tremula	56473 55291	29.27.17 28.56.19	29.27.45 28.56.47	30.58	29.12.16
Maj. 3	Sole claro cælo nubilo	55124 53946	28.51.58 28.20.42	28.52.26 28.21.10	31.16	28.36.48
Maj. 4	Sole nubilo ſpecie tremula	54475 53307	28.34.46 28. 3.39	28.35.14 28. 4. 6	31. 8	28.19.40
Maj. 5	Sole claro	53828 52659	28.17.34 27.46.15	28.18. 1 27.46.42	31.19	28. 2.21
Maj. 7	Sole languido	52585 51433	27.44.16 27.13. 5	27.44.43 27.13.31	31.12	27.29. 7
Maj. 10	ut ſupra	50813 49685	26.56.12 26.25.13	26.56.38 26.25.38	31. 0	26.41. 8
Maj. 12	Sole claro cælo nubilo	49712 48585	26.25.58 25.54.46	26.26.22 25.55.10	31.12	26.10.46
Maj. 15	claro	48152 47038	25.42.42 25.11.29	25.43. 6 25.11.52	31.14	25.27.29
Maj. 19	clariſſimo	46257 45159	24.49.26 24.18.12	24.49.49 24.18.34	31.15	24.34.11
Maj. 20	Sole claro cælo nubilo	45815 44722	24.36.54 24. 5.43	24.37.17 24. 6. 5	31.12	24.21.41
Maj. 21	clariſſimo	45391 44298	24.24.50 23.53.33	24.25.12 23.53.55	31.17	24. 9.33
Maj. 28	claro, cælo nubilo	42789 41720	23. 9.56 22.38.45	23.10.17 22.39. 6	31.11	22.54.41
Maj. 29	ut antea	42465 41402	23. 0.31 22.29.26	23. 0.52 22.29.47	31. 5	22.45.20
Maj. 30	ut ſupra	42164 41094	22.51.44 22.20.24	22.52. 5 22.20.44	31.21	22.36.24

1698		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 31	Sole languido	41866 40814	22.43. 2 22.12. 8	22.43.23 22.12.28	30.55	22.27.55
Jun. 1	Sole clariſſimo	41606 40531	22.35.25 22. 3.48	22.35.46 22. 4. 8	31.38	22.19.57
Jun. 2	ut ſupra	41334 40277	22.27.26 21.56.18	22.27.46 21.56.38	31. 8	22.12.12
Jun. 3	ut ſupra	41075 40025	22.19.49 21.48.51	22.20. 9 21.49.11	30.58	22. 4.40
Jun. 4	ut ſupra	40839 39796	22.12.53 21.42. 3	22.13.13 21.42.23	30.50	21.57.48
Jun. 5	Sole pallido	40610 39587	22. 6. 8 21.35.50	22. 6.28 21.36.10	29.58	21.51. 9
Jun. 6	ut ſupra	40408 39379	22. 0.10 21.29.38	22. 0.30 21.29.58	30.32	21.45.14
Jun. 8	pallidiſſimo	40003 39011	21.48.11 21.18.41	21.48.31 21.19. 1	28.30	21.33.16
Jun. 9	clariſſimo	39868 38816	21.44.11 21.12.52	21.44.31 21.13.12	31.19	21.28.51
Jun. 11	claro, cælo nebuloſo	39570 38539	21.35.20 21. 4.35	21.35.40 21. 4.54	30.46	21.20.17
Jun. 12	ut ſupra	39454 38405	21.31.53 21. 0.34	21.32.13 21. 0.53	31.20	21.16.33
Jun. 13	optima	39340 38296	21.28.30 20.57.18	21.28.50 20.57.37	31.13	21.13.13
Jun. 16	Sole clariſſimo	39081 38041	21.20.47 20.49.38	21.21. 7 20.49.57	31.10	21. 5.32
Jun. 17	Sole valde languido	39007 37995	21.18.34 20.48.16	21.18.54 20.48.35	30.19	21. 3.44
Jun. 18	clariſſimo	38980 37933	21.17.46 20.46.25	20.18. 6 20.46.44	31.22	21. 2.25

Jun.

1698		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jun. 19	clariſſimo	38950 37912	21.16.51 20.45.46	21.17.11 20.46. 6	31. 5	21. 1.38
Jun. 20	Sole clariſſimo. Hac nocte Tangentes meridianæ ☽ in correctæ 191471, 187533	38935 37901	21.16.24 20.45.26	21.16.44 20.45.46	30.58	21. 1.15
Jun. 21	Sole languidiſſimo. Tangentes vero ☽ incorrectæ 207547, 203016	38924 37903	21.16. 5 20.45.30	21.16.25 20.45.50	30.35	21. 1. 8
Jun. 22	Sole claro cælo nubilo	38950 37903	21.16.51 20.45.30	21.17.11 20.45.50	31.21	21. 1.30
Jun. 23	Sole claro cælo nubilo. Lunæ centrum in meridiana hor. 12.19.54 poſt meridiem. Tangen. incorrectæ 203686, 199289	38971 37938	21.17.30 20.46.33	21.17.50 20.46.52	30.58	21. 2.21
Jun. 24	Sole claro	39010 37976	21.18.39 20.47.40	21.18.59 20.47.59	31. 0	21. 3.29
Jun. 25	Sole claro	39072 38023	21.20.30 20.49. 7	21.20.50 20.49.26	31.24	21. 5. 8
Jun. 26	ut ſupra	39133 38088	21.22.20 20.51. 4	21.22.40 20.51.23	31.17	21. 7. 1
Jun. 27		39215 38177	21.24.45 20.53.38	21.25. 5 20.53.57	31. 8	21. 9.31
Jun. 28	Sole claro cælo nubilo	39310 38265	21.27.35 20.56.22	21.27.55 20.56.41	31.14	21.12.18
Jun. 29	Sole pallido	39406 38382	21.30.27 20.59.53	21.30.47 21. 0.12	30.35	21.15.29
Jul. 1	Sole claro	39675 38638	21.38.27 21. 7.33	21.38.47 21. 7.53	30.54	21.23.20
Jul. 2	ut ſupra	39825 38783	21.42.54 21.11.52	21.43.14 21.12.12	31. 2	21.27.43

Jul.

1698		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 5	Sole clariſſimo	40360 39317	21.58.45 21.27.49	21.59. 5 21.28. 9	30.56	21.43.37
Jul. 6	languido	40568 39519	22. 4.53 21.33.50	22. 5.13 21.34.10	31. 3	21.49.41
Jul. 7	clariſſimo	40784 39730	22.11.15 21.40. 6	22.11.35 21.40.26	31. 9	21.56. 0
Jul. 8	claro cælo nubilo	41020 39969	22.18.13 21.47.11	22.18.33 21.47.31	31. 2	22. 3. 2
Jul. 9	ut antea	41255 40210	22.25. 8 21.54.19	22.25.28 21.54.39	30.49	22.10. 3
Jul. 10	ut antea	41515 40461	22.32.46 22. 1.45	22.33. 6 22. 2. 5	31. 1	22.17.35
Jul. 11	Sole languido	41789 40737	22.40.47 22. 9.52	22.41. 7 22.10.12	30.55	22.25.39
Jul. 14	Sole claro	42684 41625	23. 6.53 22.36. 0	23. 7.14 22.36.20	30.54	22.51.47
Jul. 15	claro	43014 41955	23.16.29 22.45.39	23.16.50 22.45.59	30.51	23. 1.24
Jul. 16	clariſſimo	43355 42290	23.26.21 22.55.25	23.26.42 22.55.45	30.57	23.11.13
Jul. 17	clariſſimo	43709 42639	23.36.36 23. 5.35	23.36.57 23. 5.56	31. 1	23.21.26
Jul. 18	claro	44069 42995	23.46.57 23.15.55	23.47.19 23.16.16	31. 3	23.31.47
Jul. 19	ut antea	44461 43374	23.58.14 23.26.54	23.58.36 23.27.15	31.21	23.42.55
Jul. 20		44851 43767	24. 9 24 23.38.16	24. 9.46 23.38.38	31. 8	23.54.12
Jul. 21	Sole claro	45248 44169	24.20.45 23.49.50	24.21. 7 23.50.12	30.55	24. 5.39

1698		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 23	Sole clariſſimo	46100 45012	24.44.59 24.14. 0	24.45.22 24.14.22	31. 0	24.29.52
Jul. 24	ut antea	46553 45454	24.57.49 24.26.37	24.58.12 24.27. 0	31.12	24.42.36
Jul. 25	ut antea	47014 45912	25.10.49 24.39.39	25.11.12 24.40. 2	31.10	24.55.37
Jul. 26	ut antea	47508 46385	25.24.42 24.53. 4	25.25.15 24.53.27	31.48	25. 9.21
Jul. 27	ut antea	47961 46863	25.37.23 25. 6.34	25.37.47 25. 6.57	30.50	25.22.22
Jul. 28	ut antea	48479 47362	25.51.50 25.20.35	25.52.14 25.20.58	31.16	25.36.36
Jul. 29	Sole pallido	48991 47869	26. 6. 3 25.34.48	26. 6.27 25.35.12	31.15	25.50.49
Jul. 30	Sole languido	49519 48391	26.20.40 25.49.23	26.21. 5 25.49.47	31.18	26. 5.26
Jul. 31	ut ſupra	50048 48921	26.35.15 26. 4. 7	26.35.41 26. 4.31	31.10	26.20. 6
Aug. 1	Sole clariſſimo	50602 49471	26.50.26 26.19.20	26.50.52 26.19.45	31. 7	26.35.18
Aug. 4	Sole pallido	52344 51195	27.37.47 27. 6.37	27.38.24 27. 7. 3	31.21	27.22.43
Aug. 5	clariſſimo	52946 51789	27.53.58 27.22.45	27.54.25 27.23.11	31.14	27.38.48
Aug. 6	Sole claro	53570 52408	28.10.25 27.39.31	28.10.52 27.39.58	30.54	27.55.25
Aug. 8	languido	54835 53670	28.44.17 28.13.38	28.44.45 28.14. 5	30.40	28.29.25
Aug. 10	claro	56165 54987	29.19.16 28.48.19	29.19.44 28.48.47	30.57	29. 4.15

Aug.

1698		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Aug. 11	ut antea	56860 55669	29.37.22 29. 6.16	29.37.51 29. 6.44	31. 7	29.22.17
Aug. 14	pallido	58986 57784	30.32. 6 30. 1.16	30.32.36 30. 1.45	30.51	30.17.10
Aug. 16	pallido	60484 59276	31.10. 4 30.39.30	31.10.34 30.40. 0	30.34	30.55.17
Aug. 17	clariſſimo	61259 60019	31.29.28 30.58.19	31.29.59 30.58.49	31.10	31.14.24
Aug. 18	languido	62030 60792	31.48.42 31.17.47	31.49.14 31.18.18	30.56	31.34.46
Aug. 21	pallido	64456 63191	32.48.16 32.17.22	32.48.49 32.17.54	30.55	32.33.21
Aug. 22	claro	65308 64004	33. 8.53 32.37.16	33. 9.26 32.37.49	31.37	32.53.37
Aug. 24	ut antea	67011 65707	33.49.36 33.18.28	33.50.10 33.19.12	30.58	33.34.41
Aug. 25	pallido	67881 66574	34.10. 9 33.39.12	34.10.44 33.39.46	30.58	33.55.15
Aug. 28	pallido	70616 69277	35.13.42 34.42.47	35.14.18 34.43.22	30.56	34.58.50
Sept. 1	Sole claro cælo nubilo	74469 73069	36.40.29 36. 9.19	36.41. 8 36. 9.56	31.12	36.25.32
Sept. 2	Sole pallido	75448 74063	37. 2. 1 36.31.29	37. 2.40 36.32. 7	30.33	36.47.24
Sept. 3	clariſſimo	76478 75053	37.24.30 36.53.22	37.25.10 36.54. 1	31. 9	37. 9.35
Sept. 5	claro	78554 77093	38. 9. 4 37.37.47	38. 9.45 37.38.27	31.18	37.54. 6
Sept. 7	pallido	80682 79213	38.53.51 38.23. 2	38.54.24 38.23.44	30.40	38.39. 4

1698		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 9	clariſſimo	82894 81364	39.39.25 39. 8. 0	39.40. 9 39. 8.43	31.26	39.24.26
Sept. 10	ut antea	84017 82485	40. 2.10 39.31. 3	40. 2.54 39.31.45	31. 9	39.47.19
Sept. 11	clariſſimo	85159 83604	40.25. 2 39.53.50	40.25.47 39.54.34	31.13	40.10.10
Sept. 12	claro	86326 84744	40.48.10 40.16.46	40.48.56 40.17.31	31.25	40.33.13
Sept. 13	pallido	87488 85908	41.10.55 40.39.57	41.11.41 40.40.43	30.58	40.56.12
Sept. 14	clariſſimo	88693 87083	41.34.15 41. 3. 1	41.35. 2 41. 3.47	31.15	41.19.24
Sept. 15	languido	89912 88277	41.57.34 41.26.14	41.58.21 41.27. 0	31.21	41.42.40
Sept. 24	languidiſſimo	101631 99792	45.27.49 44.56.26	45.28.42 44.57.18	31.24	45.13. 0
Sept. 30	claro	110327 108312	47.48.40 47.17. 6	47.49.37 47.18. 2	31.35	47.33.49
Oct. 3	claro	114928 112838	48.58.24 48.27. 7	48.59.24 48.28. 6	31.18	48.43.45
Oct. 5	clariſſimo	118112 115915	49.44.15 49.12.57	49.45.16 49.13.57	31.19	49.29.36
Oct. 6	claro	119720 117420	50. 7.43 49.34.51	50. 8.45 49.35.52	32.53	49.52.18
Oct. 11	clariſſimo	128173 125770	52. 2.20 51.30.42	52. 3.27 51.31.48	31.39	51.47.37
Oct. 12	claro	129923 127479	52.24.55 51.53.17	52.26. 3 51.54.24	31.39	52.10.13
Oct. 13	clariſſimo	131707 129210	52.47.31 52.15.45	52.48.40 52.16.53	31.47	52.32.46

Oct.

1698		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Oct. 14	clariſſimo	133490 130966	53. 9.45 52.38.11	53.10.55 52.39.20	31.35	52.55. 7
Oct. 17	claro	139023 136350	54.16.21 53.44.37	54.17.34 53.45.48	31.46	54. 1.41
Oct. 18	pallido	140877 138188	54.37.53 54. 6.31	54.39. 7 54. 7.43	31.24	54.23.25
Oct. 20	clariſſimo	144703 141922	55.21.11 54.49.52	55.22.27 54.51. 6	31.21	55. 6.46
Oct. 22	clariſſimo	148625 145688	56. 3.58 55.32. 4	56. 5.17 55.33.21	31.56	55.49.19
Oct. 23	pallido	150687 147639	56.25.50 55.53.21	56.27.10 55.54.40	32.30	56.10.55
Oct. 24	Sole claro	152610 149577	56.45.53 55.14. 7	56.47.14 56.15.27	31.47	56.31.20
Oct. 28	clariſſimo	160853 157585	58. 7.53 57.36. 7	58. 9.19 57.37.31	31.48	57.53.25
Nov. 1	claro	169292 165780	59.25.50 58.54. 5	59.27.22 58.55.35	31.47	59.11.28
Nov. 4	clariſſimo	175797 172077	60.22. 2 59.50.16	60.23.38 59.51.49	31.49	60.7. 43
Nov. 15	clariſſimo	200124 195531	63.26.57 62.54.49	63.28.45 62.56.34	32.11	63.12.39
Nov. 17	clariſſimo	204481 199773	63.56.22 63.24.32	63.58.13 63.26.19	31.54	63.42.16
Nov. 18	ut antea	206636 201808	64.10.33 63.38.27	64.12.25 63.40.16	32. 9	63.56.20
Nov. 19	languidiſſimo	208775 203875	64.24.23 63.52.20	64.26.16 63.54.11	32. 5	64.10.13
Nov. 20	clariſſimo	210921 205946	64.38. 2 64. 6. 2	64.39.56 64. 7.53	32. 3	64.23.54

1698		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Nov.21	claro	213031 207963	64.51.14 64.19.10	64.53.11 64.21. 3	32. 8	64.37. 7
Nov.22	pallido	215075 209961	65. 3.50 64.31.58	65. 5.47 64.33.52	31.55	64.49.49
Nov.27	claro	224987 219442	66. 2.11 65.30. 5	66. 4.14 65.32. 5	32. 9	65.48. 9
Nov.28	pallido	226823 221208	66.12.31 65.40.28	66.14.35 65.42.30	32. 5	65.58.32
Dec. 4	clariſſimo	236817 230785	67. 6.26 66.34.22	67. 8.35 66.36.28	32. 7	66.52.31
Dec. 5	ut antea	238267 232165	67.13.56 66.41.29	67.16. 7 66.43.56	32.11	67. 0. 1
Dec. 7	pallido	240956 234741	67.27.39 66.55.33	67.29.51 66.57.42	32. 9	67.13.46
Dec. 16	pallido	248850 242309	68. 6.26 67.34.27	68. 8.42 67.36.40	32. 2	67.52.41
Dec. 17	clariſſimo	249294 242708	68. 8.48 67.36.27	68.11. 4 67.38.40	32.24	67.54.52
Dec. 18	claro	249620 243014	68.10. 7 67.37.58	68.12.23 67.40.11	32.12	67.56.17
Dec. 20	Sublanguido ſpecie tremula	249967 243360	68.11.45 67.39.42	68.14. 2 67.41.55	32. 7	67.58. 0
Dec. 22	languidiſſimo	249926 243348	68.11.34 67.39.38	68.13.51 67.41.51	32. 0	67.57.51
Dec. 23	clariſſimo	249763 243146	68.10.40 67.38.37	68.12.57 67.40.50	32. 7	67.56.54
Dec. 24	clariſſimo	249485 242893	68. 9.28 67.37.42	68.11.45 67.39.55	31.50	67.55.50
Dec. 25	claro	249109 242516	68. 7.41 67.35.29	68. 9.58 67.37.42	32.16	67.53.50

1699		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan.2	Sole fulgidiſſimo	242825 236498	67.37. 2 67. 4.47	67.39.15 67. 6.56	32.19	67.23. 5
Jan.3	ut antea	241613 235367	67.30.58 66.58.51	67.33.11 67. 1. 0	32.11	67.17. 5
Jan.5	ut antea	239022 232856	67.17.49 66.45.32	67.20. 1 66.47.40	32.21	67. 3.50
Jan.6	Sole claro	237582 231498	67.10.24 66.38.14	67.12.34 66.40.21	32.13	66.56.28
Jan.8	ſublanguido	234560 228623	66.54.56 66.22.31	66.56.44 66.24.36	32. 8	66.40.40
Jan.10	languidiſſimo	231265 225494	66.36.58 66. 5. 3	66.39. 5 66. 7. 6	31.59	66.23. 5
Jan.11	clariſſimo, ſpecie tremula	229536 223820	66.27.33 65.55.32	66.29.39 65.57.35	32. 4	66.13.37
Jan.15	ut antea	222122 216686	65.45.45 65.13.36	65.47.46 65.15.35	32.11	65.31.40
Jan.18	pallido	216088 210899	65.10. 0 64.37.54	65.11.58 64.39.48	32.10	64.55.53
Jan.20	Sole fulgidiſſimo ſpecie tremula	211939 206900	64.44.26 64.12.15	64.46.21 64.14. 8	32.13	64.30.15
Jan.21	ut ſupra	209793 204850	64.30.53 63.58.48	64.32.47 64. 0.39	32. 8	64.16.43
Jan.22	claro	207635 202783	64.17. 2 63.45. 1	64.18.55 63.46.50	32. 5	64. 2.52
Jan.23	pallido	205488 200723	64. 3. 1 63.31. 3	64. 4.52 63.32.51	32. 1	63.48.52
Jan.26	claro, cælo nubilo	198902 194358	63.18.31 62.46.25	63.20.19 62.48.11	32. 8	63. 4.15
Jan.27	ut ſupra	196654 192221	63. 2.47 62.30.54	63. 4.33 62.32.38	31.55	62.48.36

Jan.

1699		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 30	clariſſimo	189984 185748	62.14.22 61.42.13	62.16. 5 61.43.53	32.12	61.59.59
Jan. 31	languidiſſimo	187709 183990	61.57.15 61.28.33	61.58.57 61.30.13	28.44	61.44.35
Feb. 1	Sole fulgidiſſimo ſpecie tremula	185501 181461	61.40.18 61. 8.29	61.42. 0 61.10. 7	31.53	61.26. 4
Feb. 2	ut antea	183285 179301	61.23. 0 60.51. 2	61.24.40 60.52.39	32. 1	61. 8.40
Feb. 4	ut antea	178847 175017	60.47.19 60.15.27	60.48.56 60.17. 2	31.54	60.32.59
Feb. 7	ut antea	172234 168640	59.51.37 59.19.59	59.53.11 59.21.31	31.40	59.37.21
Feb. 8	claro	170080 166551	59.32.46 59. 1. 7	59.34.18 59. 2.37	31.41	59.18.27
Feb. 9	clariſſimo	167923 164422	59.13.32 58.41.33	59.15. 3 58.43. 2	32. 1	58.59. 2
Feb. 11	claro	163669 160327	58.34.32 58. 2.50	58.36. 0 58. 4.16	31.44	58.20. 8
Feb. 16	clariſſimo	153246 150180	56.52.25 56.20.30	56.53.47 56.21.50	31.57	56.37.48
Feb. 17	languidiſſimo	151213 148182	56.31.21 55.59.12	56.32.42 56. 0.31	32.11	56.16.36
Feb. 18	Sole claro cælo nubilo ſpecie tremula	149204 146247	56.10. 9 55.38.15	56.11.28 55.39.32	31.56	55.55.30
Feb. 19	clariſſimo	147203 144299	55.48.37 55.16.40	55.49.55 55.17.56	31.59	55.33.54
Feb. 21	claro	143302 140525	55. 5.29 54.33.49	55. 6.44 54.35. 3	31.41	54.50.54

Feb.

1699		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Feb. 22	clariſſimo	141398 138648	54.43.52 54.11.56	54.45. 6 54.13. 8	31.58	54.29. 7
Feb. 24	claro	137622 134956	53.59.49 53.27.50	54. 1. 1 53.29. 1	32. 0	53.45. 1
Feb. 25	fulgidiſſimo	135754 133145	53.37.25 53. 5.28	53.38.36 53. 6.38	31.58	53.22.37
Feb. 27	pallido	132084 129585	52.52.15 52.20.34	52.53.25 52.21.42	31.43	52.37.33
Mar. 2	languidiſſimo	126771 124409	51.43.58 51.12.28	51.45. 4 51.13.32	31.32	51.29 18
Mar. 3	fulgidiſſimo	125057 122704	51.21.11 50.49.16	51.22.15 50.50.18	31.57	51. 6.16
Mar. 4	fulgidiſſimo	123341 121036	50.57.58 50.26.10	50.59. 2 50.27.14	31.48	50.43. 8
Mar. 8	languidiſſimo	116746 114596	49.25. 4 48.53.28	49.26. 6 48.54.28	31.38	49.10.16
Mar. 9	claro	115152 113018	49. 1.42 48.29.50	49. 2.42 48.30.49	31.53	48.46.45
Mar. 10	clariſſimo. Hac nocte Tangentes meridianæ Lunæ incorrectæ fuerunt 52639, 51380	113564 111478	48.38. 3 48. 6.24	48.39. 2 48. 7.22	31.40	48.23.12
Mar. 14	claro, cælo nubilo	107473 105512	47. 3.46 46.32.11	47. 4.42 46.33. 6	31.36	46.48.54
Mar. 15	pallido	105995 104067	46.40. 1 46. 8.30	46.40.57 46. 9.24	31.33	46.25.11
Mar. 16	claro, cælo nubilo	104625 102638	46.17.41 45.44.45	46.18.36 45.45.39	32.57	46. 2. 7
Mar. 21	ut antea	97585 95808	44.17.59 43.46.24	44.18.50 43.47.15	31.35	44. 3. 3

Ee *Mar.*

1699		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 24	ut antea	93649 91934	43. 7.17 42.35.37	43. 8. 6 42.36.25	31.41	42.52.15
Mar. 25	ut antea	92374 90676	42.43.48 42.12. 2	42.44.37 42.12.49	31.48	42.28.43
Mar. 26	languido	91111 89444	42.20.13 41.48.38	42.21. 0 41.49.25	31.35	42. 5.13
Mar. 27	clariſſimo	89886 88226	41.57. 3 41.25.14	41.57.50 41.25.59	31.51	41.41.54
Mar. 28	pallido	88654 87024	41.33.30 41. 1.52	41.34.16 41. 2.36	31.40	41.18.26
Mar. 29	claro	87453 85841	41.10.14 40.38.35	41.11. 0 40.39.20	31.40	40.55.10
Mar. 30	fulgidiſſimo	86264 84667	40.46.58 40.15.13	40.47.44 40.15.57	31.47	40.31.50
Mar. 31	fulgidiſſimo	85094 83517	40.23.44 39.52. 4	40.24.29 39.52.48	31.41	40. 8.38
Apr. 4	languidiſſimo	80584 79090	38.51.47 38.20.26	38.52.30 38.21. 8	31.22	38.36.49
Apr. 5	Sole languidiſſimo	79491 78027	38.28.54 37.57.49	38.29.36 37.58.30	31. 6	38.14. 3
Apr. 9	clariſſimo	75313 73903	36.59. 4 36.27.56	36.59.43 36.28.34	31. 9	36.44. 8
Apr. 13	clariſſimo	71395 70020	35.31.30 35. 0. 1	35.32. 6 35. 0.36	31.30	35.16.21
Apr. 15	claro	69528 68180	34.48.37 34.17.10	34.49.12 34.17.45	31.27	34.33.29
Apr. 23	clariſſimo cælo nubilo	62625 61377	32. 3.25 31.32.25	32. 3.57 31.32.56	31. 1	31.48.26
Maj. 2	languido	55950 54780	29.13.37 28.42.50	29.14. 5 28.43.18	30.47	28.58.42

Maj.

1699		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 3	clariſſimo	55280 54106	28.56. 2 28.24.58	28.56.30 28.25.26	31. 4	28.40.58
Maj. 4	ut antea	54612 53452	28.38.23 28. 7.31	28.38.51 28. 7.58	30.53	28.23.25
Maj. 5	languido	53988 52798	28.21.49 27.50. 0	28.22.16 27.50.27	31.49	28. 6.21
Maj. 6	claro cælo nubilo	53350 52183	28. 4.49 27.33.27	28. 5.16 27.33.54	31.22	27.49.35
Maj. 7	languidiſſimo	52721 51580	27.47.55 27.17. 6	27.48.22 27.17.32	30.50	27.32.57
Maj. 12	clariſſimo	49835 48711	26.29.23 25.58.17	26.29.48 25.58.41	31. 7	26.14.14
Maj. 13	languido	49292 48187	26.14.23 25.43.42	26.14.47 25.44. 6	30.41	25.59.26
Maj. 17	claro	47288 46190	25.18.31 24.47.33	25.18.54 24.47.56	30.58	25. 3.25
Maj. 22	clariſſimo	45073 43994	24.15.46 23.44.48	24.16. 8 23.45.10	30.58	24. 0.39
Maj. 23	clariſſimo	44669 43592	24. 4.12 23.33.12	24. 4.34 23.33.34	31. 0	23.49. 4
Maj. 24	ut antea	44280 43205	23.53. 2 23.22. 1	23.53.24 23.22.22	31. 2	23.37.53
Maj. 25	ut antea	43913 42839	23.42.28 23.11.24	23.42.50 23.11.45	31. 5	23.27.17
Maj. 26	claro	43552 42480	23.32. 4 23. 0.58	23.32.26 23. 1.19	31. 7	23.16.52
Maj. 28	pallidiſſimo	42861 41798	23.12. 1 22.41. 3	23.12.22 22.41.24	30.58	22.56.53
Maj. 29	claro	42541 41480	23. 2.44 22.31.44	23. 3. 5 22.32. 5	31. 0	22.47.35

1699		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Maj. 30	clariſſimo, cælo nubilo	42240 41171	22.53.58 22.22.39	22.54.19 22.22.59	31.20	22.38.39
Maj. 31	ut ſupra	41939 40886	22.45.11 22.14.16	22.45.32 22.14.36	30.56	22.30. 4
Jun. 2	claro, nubibus intercurrentib.	41393 40336	22.29.11 21.58. 3	22.29.31 21.58.23	31. 8	22.13.57
Jun. 4	pallido	40906 39854	22.14.52 21.43.46	22.15.12 21.44. 6	31. 6	21.59.39
Jun. 5	clariſſimo	40675 39620	22. 8. 3 21.36.49	22. 8.23 21.37. 9	31.14	21.52.46
Jun. 6	Sole clariſſimo	40467 39412	22. 1.54 21.30.37	22. 2.14 21.30.57	31.17	21.46.35
Jun. 7	ut antea	40265 39218	21.55.56 21.24.50	21.56.16 21.25. 9	31. 7	21.40.42
Jun. 8	pallido	40068 39020	21.50. 7 21.19.15	21.50.27 21.19.34	30.53	21.35. 0
Jun. 9	claro	29903 38859	21.45.12 21.14. 9	21.45.32 21.14.28	31. 4	21.30. 0
Jun. 11	claro	39590 38580	21.35.55 21. 5.49	21.36.15 21. 6. 8	30. 7	21.21.11
Jun. 12	clariſſimo	39462 38435	21.32. 8 21. 1.29	21.32.28 21. 1.48	30.40	21.17. 8
Jun. 13	clariſſimo	39368 38319	21.29.20 20.57.59	21.29.39 20.58.18	31.21	21.13.58
Jun. 14	pallido	39250 38218	21.25.49 20.54.57	21.26. 8 20.55.16	30.52	21.10.42
Jun. 16	claro	39092 38060	21.21. 6 20.50.13	21.21.25 20.50.32	30.53	21. 5.58
Jun. 18	claro	38984 37957	21.17.53 20.47. 8	21.18.12 20.47.27	30.45	21. 2.49

Jun.

1699		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jun. 19	fulgidiſſimo	38950 37918	21.16.51 20.45.57	21.17.11 20.46.16	30.54	21. 1.44
Jun. 20	claro, cælo nubilo	38934 37896	21.16.23 20.45.17	21.16.43 20.45.36	31. 6	21. 1.10
Jun. 21	ut antea	38928 37898	21.16.12 20.45.21	21.16.32 20.45.40	30.51	21. 1. 7
Jun. 22	clariſſimo	38939 37897	21.16.32 20.45.19	21.16.52 20.45.38	31.14	21. 1.15
Jun. 23	ut antea	38957 37923	21.17. 4 20.46. 6	21.17.23 20.46.25	30.58	21. 1.54
Jun. 24	clariſſimo	38997 37959	21.18.16 20.47.11	21.18.35 20.47.30	31. 5	21. 3. 2
Jun. 25	ſublanguido	39041 38005	21.19.34 20.48.35	21.19.53 20.48.54	30.59	21. 4.23
Jun. 29	clariſſimo	39382 38341	21.29.45 20.58.38	21.30. 4 20.58.57	31. 7	21.14.29
Jun. 30	clariſſimo, ſpecie tremula	39505 38467	21.33.24 21. 2.25	21.33.44 21. 2.44	31. 0	21.18.14
Jul. 1	claro, cælo nubilo	39632 38599	21.37.10 21. 6.21	21.37.30 21. 6.30	31. 0	21.21. 0
Jul. 3	ut antea	39950 38911	21.46.37 21.15.44	21.46.57 21.16. 3	30.54	21.31.30
Jul. 4	ſublanguido	40127 39073	21.51.51 21.20.32	21.52.11 21.20.51	31.20	21.36.31
Jul. 5	clariſſimo	40315 39262	21.57.25 21.26.10	21 57.41 21.26.29	31.12	21.42. 5
Jul. 6	pallido	40511 39474	22. 3.12 21.32.29	22. 3.32 21.32.49	30.43	21.48.11
Jul. 7	clariſſimo	40724 39674	22. 9.30 21.38.25	22. 9.50 21.38.45	31. 5	21.54.17

1699		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jul. 9	clariſſimo	41190 40150	22.23.12 21.52.32	22.23.32 21.52.52	30.40	22. 8.12
Jul. 10	Sole ſubpallido	41438 40412	22.30.30 22. 0.17	22.30.51 22. 0.37	30.14	22.15.44
Jul. 11	languidiſſimo	41714 40682	22.38.35 22. 8.15	22.38.56 22. 8.35	30.21	22.23.45
Jul. 12	clariſſimo	42009 40956	22.47.13 22.16.20	22.47.34 22.16.40	30.54	22.32. 7
Jul. 13	clariſſimo	42304 41246	22.55.32 22.24.51	22.55.53 22.25.21	30.32	22.40.37
Jul. 16	clariſſimo	43273 42204	23.23.59 22.52.54	23.24.20 22.53.15	31. 5	23. 8.47
Jul. 18	pallido	43982 42907	23.44.27 23.13.22	23.44.49 23.13.43	31. 6	23.29.16
Jul. 21	clariſſimo cælo nubilo	45154 44071	24.18. 5 23.47. 1	24.18.27 23.47.23	31. 4	24. 2.55
Jul. 22	ut antea	45577 44491	24.30. 9 23.59. 6	24.30.31 23.59.28	31. 3	24.14.59
Jul. 23	clariſſimo	46009 44915	24.42.25 24.11.15	24.42.48 24.11.37	31.11	24.27.12
Jul. 24	ut antea	46453 45354	24.54.59 24.23.47	24.55.22 24.24. 9	31.13	24.39.45
Jul. 26	ut antea	47380 46277	25.21. 6 24.50. 0	21.21.29 24.50.23	31. 6	25. 5.56
Jul. 27	ut antea	47852 46752	25.34.20 25. 3.26	25.34.44 25. 3.49	30.55	25.19.16
Jul. 28	claro	48357 47247	25.48.26 25.17.22	25.48.50 25.17.45	30. 5	25.32.47
Jul. 29	languidiſſimo	48845 47686	26. 2. 0 25.29.40	26. 2.24 25.30. 3	32.21	25.46.13

1699		Tangentes correctæ a penumbra	Dist. a vertice apparens limborum	Dist. a vertice vera limborum	Diam. app. Solis	Dist. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 31	clariſſimo	49923 48797	26.31.48 26. 0.40	26.32.13 26. 1. 4	31. 9	26.16.38
Aug. 4	claro	52190 51050	27.33.37 27. 2.40	27.34. 2 27. 3. 6	30.56	27.18.34
Aug. 6	ſublanguido	53418 52260	28. 6.37 27.35.31	28. 7. 4 27.35.58	31. 6	27.51.31
Aug. 9	claro	55338 54164	28.57.34 28.26.15	28.58. 2 28.26.42	31.20	28.42.22
Aug. 10	clariſſimo	56010 54827	29.15.12 28.44. 5	29.15.40 28.44.33	31. 7	29. 0. 6
Aug. 11	ut antea	56689 55508	29.32.55 29. 2. 2	29.33.24 29. 2.30	30.54	29.17.57
Aug. 12	ut antea	57386 56196	29.51. 0 29.20. 4	29.51.29 29.20.32	30.57	29.36. 0
Sept. 8	languidiſſimo	81502 80032	39.10.51 38.40.16	39.11.34 38.40.59	30.35	38.56.16
Sept. 9	ut antea	82619 81113	39.33.48 39. 2.48	39.34.32 39. 3.31	31. 1	39.19. 1
Sept. 10	languido	83755 82217	39.56.53 39.25.34	39.57.37 39.26.17	31.20	39.41.57
Sept. 11	clariſſimo	84890 83337	40.19.41 39.48.25	40.20.26 39.49. 9	31.17	40. 4.47
Sept. 12	claro	86053 84471	40.42.47 40.11.18	40.43.33 40.12. 2	31.31	40.27.47
Sept. 13	Sole languido	87202 85636	41. 5.21 40.34.32	41. 6. 7 40.35.17	30.50	40.50.42
Sept. 15	clariſſimo	89612 87978	41.51.52 41.20.27	41.52.39 41.21.13	31.26	41.36.56
Sept. 16	ut antea	90835 89189	42.15. 2 41.43.48	42.15.49 41.44.35	31.14	42. 0.12

1699		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 17	ut antea	92091 90406	42.38.33 42. 6.56	42.39.21 42. 7.43	31.38	42.23.32
Sept. 18	claro	93330 91647	43. 1.27 42.30.16	43. 2.16 42.31. 4	31.12	42.46.40
Sept. 19	claro cælo nubilo	94612 92909	43.24.51 42.53.42	43.25.41 42.54.31	31.10	43.10. 6
Sept. 20	clariſſimo	95921 94182	43.48.26 43.17. 2	43. 9.17 43.17.52	31.25	43.33. 34
Sept. 21	clariſſimo	97243 95465	44.11.58 43.40.16	44.12.49 43.41. 6	31.43	43.56.57
Sept. 22	ut antea	98563 96787	44.35. 7 44. 3.52	44.35.59 44. 4.43	31.16	44.20.21
Sept. 23	Sole claro. Poſt eclipſim Solis inſignem	99937 98113	44.58.56 44.27.16	44.59.48 44.28. 7	31.41	44.43.57
Sept. 24	clariſſimo	101305 99462	45.22.17 44.50.45	45.23.10 44.51.37	31.33	45. 7.23
Sept. 25	pallido	102691 100821	45.45.38 45.14. 4	45.46.32 45.14.57	31.35	45.30.44
Sept. 26	claro	104106 102211	46. 9. 9 45.37.35	46.10. 3 45.38.28	31.35	45.54.15
Oct. 1	claro	111486 109463	48. 6.32 47.35.12	48. 7.30 47.36. 9	31.21	47.51.49
Oct. 2	languido	113011 110981	48.29.43 47.58.46	48.30.42 47.59.44	30.58	48.15.13
Oct. 4	claro	116125 114050	49.16. 1 48.45.20	49.17. 1 48.46.19	30.52	49. 1.45
Oct. 9	ut antea	124330 122015	51.11.24 50.39.47	51.12.29 50.40.50	31.39	50.56.39
Oct. 10	clariſſimo	125980 123659	51.33.30 51. 2.19	51.34.36 51. 3.23	31.13	51.18.59

1699		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 11	clariſſimo	127746 125368	51.56.46 51.25.21	51.57.53 51.26.26	31.27	51.41.59
Oct. 12	ut antea	129481 127065	52.19.14 51.47.50	52.20.22 51.48.56	31.26	52. 4.39
Oct. 13	claro, cælo nubilo	131237 128801	52.41.36 52.10.29	52.42.45 52.11.36	31. 9	52.27.10
Oct. 17	ut antea	138567 135905	54.11. 0 53.39.15	54.12.12 53.40.26	31.46	53.56.19
Oct. 19	clariſſimo	142311 139608	54.54.18 54.23.11	54.55.33 54.24.24	31. 9	54.39.58
Oct. 20	clariſſimo	144206 141442	55.15.38 54.44.23	55.16.54 54.45.37	31.17	55. 1.15
Oct. 22	pallido	148110 145213	55.58.26 55.26.49	55.59.45 55.28. 6	31.39	55.43.55
Oct. 23	claro ſpecie tremula	150097 147176	56.19.38 55.48.20	56.20.58 55.49.38	31.20	56. 5.18
Oct. 24	Sole pallidiſſimo	152094 149118	56.40.33 56. 9.14	56.41.53 56.10.34	31.19	56.26.12
Oct. 25	claro	154143 151089	57. 1.36 56.30. 4	57. 2.58 56.31.25	31.33	56.47.11
Oct. 26	pallidiſſimo	156179 153076	57.22. 8 56.50.41	57.23.31 56.52. 3	31.28	57. 7.47
Oct. 27	claro	158260 155072	57.42.45 57.11. 1	57.44.10 57.12.24	31.46	57.28.17
Nov. 9	pallido	186218 182227	61.45.51 61.14.37	61.47.31 61.16.16	31.15	61.31.53
Nov. 11	clariſſimo	190697 186476	62.19.40 61.47.49	62.21.23 61.49.30	31.53	62. 5.26
Nov. 14	clariſſimo	197363 192907	63. 7.46 62.35.11	63. 9.32 62.36.56	32.36	62.53.14

1699		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Nov. 15	ut antea	199570 195005	63.23. 8 62.51. 3	63.24.56 62.52.49	32. 7	63. 8.52
Nov. 16	ut antea	201752 197126	63.38. 4 63. 6. 7	63.39.53 63. 7.54	31.59	63.22.53
Nov. 17	ut antea	203920 199240	63.52.38 63.20.51	63.53.29 63.22.39	30.50	63.38. 4
Nov. 19	ut antea	208220 203370	64.20.49 63.48.58	64.22.42 63.50.48	31.54	64. 6.45
Nov. 20	ut antea	210377 205444	64.34.36 64. 2.44	64.36.30 64. 4.35	31.55	64.20.32
Nov. 21	ut antea	212447 207461	64.47.36 64.15.54	64.49.32 64.17.46	31.46	64.33.39
Nov. 22	ut antea	214566 209466	65. 0.43 64.28.48	65. 2.40 64.30.42	31.58	64.46.41
Nov. 23	ut antea	216625 211427	65.13.15 64.41.13	65.15.13 64.43. 8	32. 5	64.59.10
Nov. 24	ut antea	218647 213383	65.25.22 64.53.25	65.27.21 64.55.22	31.59	65.11.21
Nov. 26	ut antea	222607 217178	65.48.34 65.16.34	65.50.35 65.18.32	32. 3	65.34.33
Nov. 27	Sole languido	224533 219004	65.59.37 65.27.29	66. 1.40 65.29.29	32.11	65.45.34
Nov. 29	Sole claro	228199 222540	66.20.11 65.48.10	66.22.15 65.50.11	32. 4	66. 6.13
Nov. 30	clariſſimo, cælo nubilo	229955 224242	66.29.50 65.57.57	66.31.56 66. 0. 0	31.56	66.15.58
Dec. 5	claro, cælo nebuloſo	237905 231831	67.12. 4 66.40. 2	67.14.14 66.42. 9	32. 5	66.58.11
Dec. 8	ut antea	241855 235650	67.32.11 67. 0.20	67.34.24 67. 2.29	31.55	67.18.26

1699		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Dec. 11	ſublanguido	245082 238732	67.48.11 67.16.23	67.50.26 67.18.34	31.52	67.34.30
Dec. 12	clariſſimo	246010 239518	67.52.46 67.20.21	67.55. 1 67.22.32	32.29	67.38.46
Dec. 16	claro	248742 242188	68. 5.56 67.33.51	68. 8.12 67.36. 4	32. 8	67.52. 8
Dec. 27	fulgidiſſimo	248248 241697	68. 3.34 67.31.23	68. 5.50 67.33.36	32.14	67.49.43
Dec. 28	Sole pallido	247562 241088	68. 0.15 67.28.19	68. 2.31 67.30.31	32. 0	67.46.31
Dec. 30	Sole clariſſimo	246046 239610	67.52.43 67.20.49	67.54.59 67.23. 0	31.59	67.38.59
1700						
Jan. 1	Sole clariſſimo	244113 237769	67.43.25 67.11.22	67.45.39 67.13.32	32. 7	67.29.35
Jan. 2	ut antea	243050 236758	67.38. 9 67. 6. 8	67.40.22 67. 8.18	32. 4	67.24.20
Jan. 3	ut antea	241879 235635	67.32.18 67. 0.16	67.34.31 67. 2.25	32. 6	67.18.28
Jan. 4	ut antea	240614 234460	67.25.55 66.54. 4	67.28. 7 66.56.12	31.55	67.12. 9
Jan. 5	ut antea	239296 233171	67.19.13 66.47.13	67.21.24 66.49.21	32. 3	67. 5.22
Jan. 6	claro	237901 231860	67.12. 3 66.40.11	67.14.13 66.42.18	31.55	66.58.15
Jan. 7	clariſſimo	236481 230460	67. 4.41 66.32.36	67. 6.50 66.34.42	32. 8	66.50.46
Jan. 8	ut antea	234950 228983	66.56.39 66.24.30	66.58.48 66.26.35	32.13	66.42.41

1700		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
*Jan.*9	ut antea	233347 227462	66.48.10 66.16. 5	66.50.18 66.18.10	32. 8	66.34.14
*Jan.*10	ut antea	231657 225868	66.39. 5 66. 7. 9	66.41.12 66. 9.13	31.59	66.25.12
*Jan.*12	ut antea	228161 222518	66.19.59 65.48. 3	66.22. 4 65.50. 5	31.59	66. 6. 4
*Jan.*13	ut antea	226366 220760	66. 9.57 65.37.50	66.12. 1 65.39.51	32.10	65.55.56
*Jan.*14	ut antea	224507 218971	65.59.27 65.27.17	66. 1.30 65.29.17	32.13	61.45.23
*Jan.*15	ut antea, ſpecie tremula	222558 217124	65.48.17 65.16.15	65.50.19 65.18.14	32. 5	65.34.16
*Jan.*16	clariſſimo	220598 215258	65.36.53 65. 4.56	65.38.54 65. 6.53	32. 1	65.22.53
*Jan.*17	ut antea	218619 213349	65.25.11 64.53.12	65.27.11 64.55. 8	32. 3	65.11. 9
*Jan.*18	ut antea	216581 211408	65.12.59 64.41. 6	65.14.57 64.43. 1	31.56	64.58.59
*Jan.*19	ut antea	214529 209410	65. 0.29 64.28.26	65. 2.26 64.30.20	32. 6	64.46.23
*Jan.*20	ut antea	212428 207594	64.47.29 64.16.46	64.49.25 64.18.39	30.46	64.34. 2
*Jan.*21	clariſſimo, cælo nubilo	210277 205349	64.33.57 64. 2. 6	64.35.51 64. 3.57	31.54	64.19.54
*Jan.*22	clariſſimo	208166 203275	64.20.28 63.48.19	64.22.21 63.50. 9	32.12	64. 6.15
*Jan.*23	ut antea	206025 201229	64. 6.33 63.34.30	64. 8.25 63.36.19	32. 6	63.52.22
*Jan.*24	ſubpallido	203795 199124	63.51.48 63.20. 3	63.53.38 63.21.52	31.46	63.37.45

Jan.

1700		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jan. 25	Sole clariſſimo ſpecie tremula	201624 196992	63.37.11 63. 5.10	63.39. 0 63. 6.56	32. 4	63.22.58
Jan. 27	clariſſimo	197217 192741	63. 6.45 62.34.42	63. 8.32 62.36.26	32. 6	62.52.29
Jan. 30	ut antea	190510 186295	62.18.17 61.46.27	62.20. [illegible] 61.48. [illegible]	31.52	62. 4. 4
Jan. 31	ut antea	188278 184136	62. 1.33 61.29.41	62. 3.1[illegible] 61.31.2[illegible]	31.5[illegible]	61.47.18
Feb. 4	ut antea	179408 17555[illegible]	60.51.55 60.19.57	60.53.3[illegible] 60.21.3[illegible]	32. [illegible]	60.37.32
Feb. 5	Sole claro cælo nubilo	17718[illegible] [illegible]7341[illegible]	60.33.40 60. 1.48	60.35.16 60. 3.22	31.54	60.19.19
Feb. 6	clariſſimo	[illegible]7497[illegible] [illegible]7128[illegible]	60.15. 7 59.43.19	60.16.42 59.44.52	31.5[illegible]	60. 0.47
Feb. 8	languido	[illegible]7060[illegible] [illegible]6705[illegible]	59.37.21 59. 5.39	59.38.53 59. 7. 9	31.44	59.23. 1
Feb. 10	fulgidiſſimo	[illegible]66302 162880	[illegible]8.58.51 58.27. 8	59. 0.21 58.28.36	31.45	58.44.28
Feb. 11	claro	164162 160832	58.39. 8 58. 7.41	58.40.37 58. 9. 7	31.30	58.24.52
Feb. 12	claro, cælo nubilo	162052 158763	58.19.19 57.47.40	58.20.46 57.49. 5	31.41	58. 4.55
Feb. 17	clariſſimo	151715 148678	56.36.36 56. 4.32	56.37.57 56. 5.51	32. 6	56.21.54
Feb. 18	ut antea	149688 146720	56.15.17 55.43.22	56.16.37 55.44.40	31.57	56. 0.38
Feb. 21	ut antea	143762 140972	55.10.40 54.38.59	55.11.56 54.40.13	31.43	54.56. 4
Feb. 22	pallido	141853 139113	54.49. 4 54.17.25	54.50.18 54.18.38	31.40	54.34.28

Feb.

1700		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 23	pallido	139950 137242	54.27.10 53.55.17	54.28.23 53.56.29	31.54	54.12.26
Feb. 26	claro, cælo nubilo	134345 131797	53.20.16 52.48.39	53.21.27 52.49.48	31.39	53. 5.37
Mar. 1	ut antea	128950 126532	52.12.24 51.40.49	52.13.32 51.41.55	31.37	51.57.43
Mar. 4	ut antea	123750 121444	51. 3.32 50.31.52	51. 4.36 50.32.56	31.40	50.48.46
Mar. 9	ut antea	115521 113412	49. 7. 9 48.35.46	49. 8. 9 48.36.45	31.24	48.52.27
Mar. 19	ſublanguido	100751 98820	45.12.52 44.39.36	45.13.44 44.40.28	33.16	44.57. 6
Mar. 21	pallidiſſimo	97918 96152	44.23.51 43.52. 4	44.24.42 43.53.25	31.17	44. 9. 3
Mar. 22	clariſſimo	96570 94818	44. 0. 1 43.28.35	44. 0.52 43.29.25	31.27	43.45. 8
Mar. 23	clariſſimo	95251 93516	43.36.24 43. 4.51	43.37.14 43. 5.40	31.34	43.21.27
Mar. 24	clariſſimo	93951 92241	43.12.49 42.41.19	43.13.38 42.42. 7	31.31	42.57.52
Mar. 25	clariſſimo	92673 90977	42.49.20 42.17.42	42.50. 9 42.18.30	31.39	42.34.19
Mar. 27	Sole pallidiſſimo	90155 88530	42. 2.10 41.31. 7	42. 2.57 41.31.54	31. 3	41.47.25
Apr. 1	nubilo	84197 82660	40. 5.47 39.34.48	40. 6.31 39.35.32	30.59	39.51. 1
Apr. 8	claro, cælo nubilo	76588 75158	37.26.52 36.55.40	37.27.32 36.56.19	31.13	37.11.55
Apr. 9	clariſſimo	75563 74150	37. 4.33 36.33.25	37. 5.12 36.34. 3	31. 9	36.49.37

Apr.

1700		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 12	clariſſimo	72591 71200	35.58.35 35.27. 3	35.59.12 35.27.39	31.33	35.43.25
Apr. 13	pallido	71626 70257	35.36.45 35. 5.27	35.37.21 35. 6. 2	31.19	35.21.41
Apr. 14	pallido	70675 69322	35.15. 3 34.43.50	35.15.39 34.44.26	31.13	35. 0. 2
Apr. 15	pallido	69684 68388	34.52.13 34.22. 3	34.52.49 34.22.38	30.11	34.37.43
Apr. 23	clariſſimo	62816 61563	32. 8. 7 31.37. 3	32. 8.39 31.37.34	31. 5	31.53. 6
Apr. 24	clariſſimo	62022 60781	31.48.29 31.17.40	31.49. 1 31.18.11	30.50	31.33.36
Maj. 1	clariſſimo	56804 55615	29.35.54 29. 4.51	29.36.23 29. 5.19	31. 4	29.20.51
Maj. 2	ut antea	56120 54931	29.18. 5 28.46.49	29.18.33 28.47.17	31.16	29. 2.55
Maj. 3		55430 54259	28.59.58 28.29. 2	29. 0.27 28.29.30	30.57	28.44.58
Maj. 4	Sole claro	54769 53612	28.42.33 28.11.47	28.43. 1 28.12.14	30.47	28.27.37
Maj. 5	clariſſimo	54121 52968	28.25.22 27.54.33	28.25.50 27.55. 0	30.50	28.10.25
Maj. 6	ut antea	53496 52335	28. 8.42 27.37.32	28. 9. 9 27.37.59	31.10	27.53.34
Maj. 7	pallido	52879 51732	27.52.10 27.21.13	27.52.37 27.21.39	30.58	27.37. 8
Maj. 9	clariſſimo	51673 50538	27.19.36 26.48.39	27.20. 2 26.49. 5	30.57	27. 4.33
Maj. 10	pallido	51087 49981	27. 3.40 26.33.23	27. 4. 6 26.33.49	30.17	26.48.57

Maj.

1700		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 1	claro	49427 48330	26.18. 7 25.47.23	26.18.32 25.47.47	30.45	26. 3. 9
Maj. 16	clariſſimo	47893 46785	25.35.28 25. 4.21	25.35.52 25. 4.44	31. 8	25.20.18
Maj. 19	clariſſimo	46466 45376	24.55.21 24.24.24	24.55.44 24.24.46	30.58	24.40.15
Maj. 20	ut antea	46027 44937	24.42.55 24.11.51	24.43.18 24.12.13	31. 5	24.27.45
Maj. 21	ut antea	45592 44506	24.30.33 23.59.31	24.30.56 23.59.53	31. 3	24.15.24
Maj. 22	ut antea	45182 44084	24.18.51 23.47.23	24.19.13 23.47.44	31.29	24. 3.28
Maj. 23	pallido	44761 43688	24. 6.50 23.35.58	24. 7.12 23.36.20	30.52	23.51.46
Maj. 25	Sole claro	43966 42929	23.44. 0 23.14. 0	23.44.22 23.14.21	30. 1	23.29.21
Maj. 26	Sole claro	43622 42564	23.34. 4 23. 3.23	23.34.26 23. 3.44	30.42	23.19. 5
Maj. 31	clariſſimo	42003 40950	22.47. 2 22.16. 9	22.47.23 22.16.29	30.54	22.31.56
Jun. 1	claro	41721 40673	22.38.48 22. 7.58	22.39. 9 22. 8.18	30.51	22.23.43
Jun. 4	clariſſimo	40950 39907	22.16. 9 21.45.19	22.16.29 21.45.40	30.49	22. 1. 4
Jun. 6	clariſſimo	40503 39466	22. 2.58 21.32.14	22. 3.18 21.32.35	30.43	21.47.56
Jun. 8	clariſſimo	40118 39081	21.51.35 21.20.46	21.51.56 21.21. 6	30.50	21.36.31
Jun. 9	ut antea	39943 38900	21.46.24 21.15.22	21.46.45 21.15.42	31. 3	21.31.13

Jun.

1700		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 10	ut antea	39782 38748	21.41.37 21.10.49	21.41.57 21.11. 8	30.49	21.26.32
Jun. 11	ut antea	39635 38605	21.37.16 21. 6.33	21.37.36 21. 6.52	30.44	21.22.14
Jun. 12	ut ſupra	39491 38473	21.32.58 21. 2.35	21.33.18 21. 2.54	30.24	21.18. 6
Jun. 13	ut ſupra	39382 38349	21.29.44 20.58.53	21.30. 4 20.59.12	30.52	21.14.38
Jun. 14	ut ſupra	39278 38242	21.26.38 20.55.40	21.26.58 20.55.59	30.59	21.11.28
Jun. 15	ut ſupra	39183 38151	21.23.48 20.52.56	21.24. 8 20.53.15	30.53	21. 8.41
Jun. 18	pallidiſſimo	38992 37960	21.18. 7 20.47.13	21.18.27 20.47.32	30.55	21. 2.59
Jun. 19	pallidiſſimo	38950 37933	21.16.51 20.46.24	21.17.11 20.46.43	30.28	21. 1.57
Jun. 23	claro	38950 37916	21.16.51 20.45.53	21.17.11 20.46.12	30.59	21. 1.41
Jun. 25	pallido	39023 37999	21.19. 2 20.48.23	21.19.22 20.48.42	30.40	21. 4. 2
Jun. 27	clariſſimo	39173 38166	21.23.30 20.53.24	21.23.49 20.53.43	30. 6	21. 8.46
Jun. 28	ut antea	39250 38225	21.25.48 20.55. 9	21.26. 8 20.55.28	30.40	21.10.48
Jun. 29	claro	39360 38325	21.29. 5 20.58. 9	21.29.25 20.58.28	30.57	21.13.56
Jun. 30	clariſſimo	39480 38441	21.32 39 21. 1.38	21.32.59 21. 1.57	31. 2	21.17.28
Jul. 1	ut antea	39597 38575	21.36. 7 21. 5.39	21.36.27 21. 5.58	30.29	21.21.12

1700		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jul. 2	ut antea	39743 38714	21.40.28 21. 9.48	21.40.48 21.10. 7	30.41	21.25.27
Jul. 3	ut antea	39898 38875	21.45. 4 21.14.37	21.45.25 21.14.56	30.29	21.30.10
Jul. 4	claro	40079 39044	21.50.25 21.19.40	21.50.46 21.20. 0	30.46	21.35.23
Jul. 5	Sole clariſſimo	40266 39216	21.55.58 21.24.47	21.56.19 21.25. 7	31.12	21.40.43
Jul. 7	ut antea	40671 39630	22. 7.55 21.37. 7	22. 8.15 21.37.28	30.47	21.52.52
Jul. 8	ut antea	40895 39851	22.14.32 21.43.40	22.14.52 21.44. 0	30.52	21.59.26
Jul. 9	claro	41130 40091	22.21.26 21.50.47	22.21.46 21.51. 8	30.38	22. 6.27
Jul. 10	clariſſimo	41384 40339	22.28.55 21.58. 7	22.29.16 21.58.28	30.48	22.13.52
Jul. 11	claro, cælo nubilo	41661 40611	22.37. 2 22. 6. 9	22.37.23 22. 6.29	30.54	22.21.56
Jul. 12	clariſſimo	41939 40889	22.45.10 22.14.21	22.45.31 22.14.41	30.50	22.30. 6
Jul. 13	ut antea	42235 41168	22.53.45 22.22.34	22.54. 6 22.22.54	31.12	22.38.30
Jul. 14	ut antea	42530 41493	23. 2.29 22.32. 5	23. 2.45 22.32.26	30.19	22.47.35
Jul. 15	ut antea	42857 41775	23.11.55 22.40.21	23.12.16 22.40.42	31.34	22.56.29
Jul. 16	claro	43188 42130	23.21.31 22.50.44	23.21.52 22.51. 5	30.47	23. 6.28
Jul. 18	Sole pallido	43088 42837	23.41.45 23.11.19	23.42. 7 23.11.40	30.27	23.26.53

Jul.

1700		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 19	clariſſimo	44262 43204	23.52.31 23.21.58	23.52.53 23.22.19	30.34	23.37.36
Jul. 20	claro	44657 43583	24. 3.51 23.32.57	24. 4.13 23.33.19	30.54	23.48.46
Jul. 21	ut antea	45059 43977	24.15.21 23.44.19	24.15.43 23.44.41	31. 2	24. 0.12
Jul. 22	ut antea	45470 44392	24.27. 5 23.56.14	24.27.27 23.56.36	30.51	24.12. 1
Jul. 23	pallido	45897 44814	24.39.14 24. 8.21	24.39.37 24. 8.43	30.54	24.24.10
Jul. 24	clariſſimo	46337 45249	24.51.42 24.20.46	24.52. 5 24.21. 8	30.57	24.36.36
Jul. 27	pallido	47737 46627	25.31. 7 24.59.53	25.31.31 25. 0.16	31.15	25.15.53
Jul. 28	clariſſimo	48233 47129	25.44.58 25.14. 2	25.45.22 25.14.25	30.57	25.29.53
Jul. 29	nebuloſo	48739 47629	25.59. 3 25.28. 5	25.59.27 25.28.28	30.59	25.43.57
Jul. 30	claro	49257 48139	26.13.24 25.42.20	26.13.48 25.42.44	31. 4	25.58.16
Aug. 1	pallido	50336 49210	26.43. 8 26.12. 7	26.43.33 26.12.31	31. 2	26.28. 2
Aug. 2	claro	50904 49765	26.58.41 26.27.26	26.59. 7 26.27.51	31.16	26.43.29
Aug. 3	claro	51468 50329	27.14. 2 26.42.57	27.14.28 26.43.23	31. 5	26.58.55
Aug. 4	claro	52051 50907	27.29.50 26.58.45	27.30.16 26.59.11	31. 5	27.14.43
Aug. 6	Sole claro	53268 52107	28. 2.36 27.31.21	28. 3. 2 27.31.48	31.15	27.47.25

1700		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 8	clariſſimo	54529 53364	28.36.11 28. 5.10	28.36.39 28. 5.57	31. 2	28.21. 8
Aug. 9	ut antea	55179 54005	28.53.22 28.22.16	28.53.51 28.22.44	31. 7	28.38.17
Aug. 10	ut antea	55853 54662	29.11.13 28.39.43	29.11.41 28.40.11	31.30	28.55.56
Aug. 11	ut antea	56525 55342	29.28.39 28.57.39	29.29. 7 28.58. 8	30.59	29.13.37
Aug. 12	ut antea	57217 56025	29.46.37 29.15.35	29.47. 6 29.16. 3	31. 3	29.31.34
Aug. 14	ut antea	58649 57447	30.23.28 29.52.34	30.23.57 29.53. 3	30.54	30. 8.30
Aug. 15	pallido	59377 58168	30.42. 2 30.11. 9	30.42.32 30.11.38	30.54	30.27. 5
Aug. 16	clariſſimo	60133 58901	31. 1.11 30.29.54	31. 1.41 30.30.23	31.18	30.46. 2
Aug. 17	ut antea	60885 59667	31.20. 6 30.49.24	31.20.36 30.50. 4	30.32	31. 5.20
Aug. 18	ut antea	61664 60415	31.39.35 31. 8.18	31.40. 6 31. 8.48	31.18	31.24.27
Aug. 19	ut antea	62446 61206	31.58.59 31.28. 9	31.59.31 31.28.40	30.51	31.44. 5
Aug. 21	ut antea	64069 62798	32.38.50 32. 7.26	32.39.23 32. 7.58	31.25	32.23.40
Aug. 23	claro	65745 64454	33.19.23 32.48.12	33.19.56 32.48.45	31.11	33. 4.20
Aug. 25	cælo nubilo	67472 66164	34. 0.30 33.29.24	34. 1. 5 33.29.57	31. 8	33.45.31
Aug. 26	fulgidiſſimo	68355 67038	34.21.17 33.50.14	34.21.53 33.50.49	31. 4	34. 6.21

1700		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Aug. 28	clariſſimo	70177 68829	35. 3.36 34.32.22	35. 4.11 34.32.58	31.13	34.48.34
Aug. 31	pallidiſſimo	73008 71656	36. 7.57 35.37.27	36. 8.34 35.38. 3	30.31	35.53.18
Sept. 2	clariſſimo	74970 73575	36.51.32 36.20.33	36.52.11 36.21. 1	31.10	36.36.36
Sept. 3	claro	75992 74568	37.13.55 36.42.40	37.14.34 36.43.18	31.16	36.58.56
Sept. 4	clariſſimo	77010 75577	37.36. 0 37. 4.51	37.36.40 37. 5.30	31.10	37.21. 5
Sept. 5	cælo ſubnubilo	78045 76601	37.58.13 37.27. 9	37.58.54 37.27.49	31. 5	37.43.21
Sept. 7	claro	80163 78681	38.43. 0 38.11.48	38.43.42 38.12.29	31.13	38.28. 5
Sept. 8	ut antea	81250 79791	39. 5.38 38.35.13	39. 6.21 38.35.55	30.26	38.51. 8
Sept. 9	ut antea	82347 80840	39.28.13 38.57. 8	39.28.56 38.57.51	31. 5	39.13.23
Sept. 10	pallido	83469 81942	39.51. 5 39.19.55	39.51.49 39.20.38	31.11	39.36.13
Sept. 11	Sole claro	84601 83060	40.13.54 39.42.47	40.14.38 39.43.30	31. 8	39.59. 4
Sept. 12	clariſſimo	85752 84194	40.36.49 40. 5.43	40.37.34 40. 6.27	31. 7	40.22. 0
Sept. 13	ut antea	86923 85333	40.59.53 40.28.31	41. 0.39 40.29.16	31.23	40.44.57
Sept. 15	pallido	89295 87678	41.45.48 41.14.37	41.46.36 41.15.23	31.13	41.31. 0
Sept. 16	clariſſimo	90534 88891	42. 9.20 41.38. 3	42.10. 7 41.38.50	31.17	41.54.28

Sept.

1700		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 17	pallidiſſimo	91779 90098	42.32.43 42. 1. 6	42.33.31 42. 1.53	31.38	42.17.42
Sept. 18	claro	93026 91344	42.55.51 42.24.35	42.56.40 42.25.23	31.17	42.41. 1
Sept. 19	clariſſimo	94301 92598	43.19.12 42.47.57	43.20. 2 42.48.46	31.16	43. 4.24
Sept. 20	clariſſimo	95600 93862	43.42.41 43.11.11	43.43.31 43.12. 0	31.31	43.27.45
Sept. 23	pallido	99587 97799	44.52.53 44.21.45	44.53.45 44.22.36	31. 9	44.38.10
Sept. 25	clariſſimo	102351 100497	45.39.56 45. 8.31	45.40.49 45. 9.23	31.26	45.25. 6
Sept. 27	ut antea	105177 103279	46.26.43 45.55.27	46.27.38 45.56.21	31.17	46.11.59
Sept. 28	ut antea	106624 104695	46.50.11 46.18.50	46.51. 7 46.19.45	31.22	46.35.26
Sept. 29	nubilo	108084 106125	47.13.30 46.42. 8	47.14.26 46.43. 3	31.23	46.58.44
Sept. 30	nubilo	109585 107589	47.37. 7 47. 5.37	47.38. 5 47. 6.33	31.32	47.22.19
Oct. 1	claro	111104 109079	48. 0.38 47.29.11	48. 1.36 47.30. 8	31.28	47.45.52
Oct. 6	clariſſimo	118926 116754	49.56.27 49.25.11	49.57.30 49.26.12	31.18	49.41.51
Oct. 7	clariſſimo	120562 118347	50.19.34 49.48.11	50.20.38 49.49.13	31.25	50. 4.55
Oct. 8	claro	122249 119950	50 43. 0 50.10.57	50.44. 5 50.12. 1	32. 4	50.28. 3
Oct. 9	nubilo	123877 121608	51. 5.16 50.34. 8	51. 6.20 50.35.12	31. 8	50.50.46

Oct.

1700		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 12	claro, cælo nubilo	129048 126650	52.13.40 51.42.22	52.14.48 51.43.28	31.20	51.59. 8
Oct. 13	claro	130817 128373	52.36.17 52. 4.55	52.37.26 52. 6. 2	31.24	52.21.42
Oct. 14	clariſſimo	132608 130101	52.58.48 52.27.11	52.59.58 52.28.19	31.39	52.44. 8
Oct. 17	ut antea. Deeſt hæc obſervatio in meis adverſariis, ſed eam deſcripſi e ſchedis calculorum longitudinis Solis quos dietim a ſororibus ſubduci curabam	138094 135454	54. 5.24 53.33.47	54. 6.36 53.34.58	31.38	53.50.47
Oct. 23	Sole clariſſimo	149613 146675	56.14.30 55.42.53	56.15.50 55.44.10	31.40	56. 0. 0
Oct. 27	Sole clariſſimo. Hæc quoque e ſchedis ſupputationum diurnarum	157748 154564	57.37.42 57. 6.53	57.39. 6 57. 8.15	30.51	57.23.40
Oct. 31	clariſſimo. Et hæc ex iiſdem ſchedis	166394 162712	58 59.42 58.25.33	59. 1.12 58.26.59	34.13	
Nov. 1	Sole claro	168237 164763	59.16.22 58.44.41	59.17.53 58.46. 0	31.53	59. 1.56
Nov. 8	Sole pallido	183457 179553	61.24.21 60.53. 5	61.26. 1 60.54.43	31.18	61.10.22
Nov. 9	claro	185721 181678	61.42. 0 61.10.14	61.43.42 61.11.53	31.49	61.27.47
Nov. 13	clariſſimo	194590 190243	62.48. 5 62.16.17	62.49.50 62.18. 0	31.50	62.33.55
Nov. 14	clariſſimo	196772 192368	63. 3.36 62.31.59	63. 5.22 62.33.43	31.39	62.49.32

Nov.

1700		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Nov. 19	ut antea	207710 202872	64.17.31 63.45.37	64.19.24 63.47.27	31.57	64. 3.25
Nov. 20	claro	209848 204935	64.31.14 63.59.22	64.33. 8 64. 1.13	31.55	64.17.10
Dec. 5	clariſſimo	237560 231477	67.10.17 66.38. 7	67.12.27 66.40.14	32.13	66.56.20
Dec. 6	ut antea	238950 232830	67.17.27 66.45.24	67.19.38 66.47.32	32. 6	67. 3.35
Dec. 8	claro	241543 235309	67.30.37 66.58.33	67.32.50 67. 0.42	32. 8	67.16.46
Dec. 11	pallido	244867 238467	67.47. 8 67.14.58	67.49.22 67.17. 9	32.13	67.33.15
Dec. 27	claro	248319 241781	68. 3.54 67.31.50	68. 6.10 67.34. 3	32. 7	67.50. 6
Dec. 29	claro	247048 240574	67.57.46 67.25.41	68. 0. 2 67.27.53	32. 9	67.43.57
1701						
Jan. 2	Sole clariſſimo	243333 236979	67.39.34 67. 7.17	67.41.48 67. 9.27	32.21	67.25.37
Jan. 3	ut antea	242200 235928	67.33.55 67. 1.48	67.36. 8 67. 3.57	32.11	67.20. 2
Jan. 5	ut antea	239675 233499	67.21. 9 66.48.58	67.23.20 66.51. 6	32.14	67. 7.13
Jan. 6	ut antea	238264 232160	67.13.55 66.41.48	67.16. 5 66.43.55	32.10	67. 0. 0
Jan. 7	ut antea	236843 230793	67. 6.43 66.34.24	67. 8.53 66.36.30	32.23	66.52.41
Jan. 8	ut antea	235325 229361	66.58.38 66.26.35	67. 0.47 66.28.39	32. 8	66.44.43

1701		Tangentes correctæ ape numbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jan. 9	ut antea	233740 227835	66.50.15 66.18. 9	66.52.23 66.20.14	32. 9	66.36.18
Jan. 10	Sole pallido	232089 226285	66.41.25 66. 9.30	66.43.32 66.11.34	31.58	66.27.33
Jan. 12	claro	228600 222912	66.22.24 65.50.19	66.24.29 65.52.21	32. 8	66. 8.25
Jan. 14	clariſſimo	224955 219410	66. 1.59 65.29.53	66. 4. 2 65.31.53	32. 9	65.47.57
Feb. 7	Sole clariſſimo	173305 169673	60. 0.52 59.29.11	60. 2.26 59.30.43	31.43	59.46.34
Feb. 8	ut antea	171111 167566	59.41.51 59.10.19	59.43.24 59.11.50	31.34	59.27.37
Feb. 10	ut antea	166801 163353	59. 3.24 58.31.35	59. 4.54 58.33. 3	31.51	58.48.58
Feb. 11	ut antea	164682 161321	58.43.57 58.12.22	58.45.26 58.13.49	31.37	58.29.37
Feb. 12	ut antea. Hanc obſervationem huc retuli e ſchedis calculorum cum in adverſariis deſit	162570 159250	58.24. 3 57.52.24	58.25.31 57.53.46	31.45	58. 9.38
Feb. 13	ut antea	160461 157195	58. 4. 7 57.32.15	58. 5.33 57.33.39	31.54	57.49.36
Feb. 16	ut antea	154220 151142	57. 2.23 56.30.37	57. 3.45 56.31.58	31.48	56.47.52
Feb. 17	ut antea	152183 149149	56.41.28 56. 9.34	56.42.49 56.10.53	31.56	56.26.51
Feb. 18	ut antea	150150 147170	56.20.11 55.48.16	56.21.31 55.49.34	31.57	56. 5.32
Feb. 21	ut antea	144234 141449	55.15.57 54.44.27	55.17.13 54.45.41	31.32	55. 1.27

1701		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 27	ut antea	132960 130439	53. 3.11 52.31.29	53. 4.21 52.32.38	31.43	52.48.29
Mar. 6	ut antea	120808 118554	50.23. 0 49.51. 9	50.24. 4 49.52.12	31.52	50. 8. 8
Mar. 10	Sole pallidiſſimo	114319 112257	48.49.21 48.18.18	48.50.21 48.19.17	31. 4	48.34.49
Mar. 11	clariſſimo	112772 110707	48.26. 6 47.54.32	48.27. 5 47.55.30	31.35	48.11.17
Mar. 12	ut antea	111228 109171	48. 2.34 47.30.38	48. 3.32 47.31.35	31.57	47.47.33
Mar. 18	pallidiſſimo	102366 100527	45.40.11 45. 9. 2	45.41. 4 45. 9.54	31.10	45.25.29
Mar. 19	pallido	100982 99130	45.16.48 44.44.59	45.17.41 44.45.51	31.50	45. 1.46
Mar. 20	pallido	99581 97790	44.52.47 44.21.36	44.53.39 44.22.27	31.12	44.38. 3
Mar. 21	clariſſimo	98240 96452	44.29.28 43.57.55	44.30.19 43.58.46	31.33	44.14.32
Mar. 22	ut antea	96904 95134	44. 5.57 43.34.17	44. 6.48 43.35. 7	31.41	43.50.57
Mar. 23	clariſſimo	95576 93823	43.42.15 43.10. 0	43.43. 5 43.11.17	31.48	43.27.11
Mar. 24	pallidiſſimo	94258 92562	43.18.25 42.47.17	43.19.15 42.48. 6	31. 9	43. 3.40
Mar. 25	fulgidiſſimo	92985 91282	42.55. 6 42.23.26	42.55.55 42.24.14	31.41	42.40. 4
Mar. 26	claro	91724 90054	42.31.42 42. 0.16	42.32.30 42. 1. 3	31.27	42.16.46
Mar. 29	claro	88030 86418	41.21.27 40.49.59	41.22.14 40.50.45	31.29	41. 6.29

Mar.

1701		Tangentes correctæ ape numbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 30	clariſſimo	86839 85235	40.58.14 40.26.34	40.59. 0 40.27.19	31.41	40.43. 9
Mar. 31	Sole pallidiſſimo	85633 84092	40.34.28 40. 3.40	40.35.13 40. 4.24	30.49	40.19.48
Apr. 5	ut antea	79980 78536	38.39.10 38. 8.41	38.39.52 38. 9.22	30.30	38.24.37
Apr. 14	clariſſimo	70913 69542	35.20.30 34.48.56	35.21. 6 34.49.32	31.34	35. 5.19
Apr. 18	pallidiſſimo	67235 65954	33.54.54 33.24.23	33.55.29 33.24.57	30.32	33.40.13
Apr. 19	clariſſimo	66311 65070	33.34.21 33. 3. 7	33.34.55 33. 3.40	31.15	33.19.17
Apr. 20	ut antea	65514 64224	33.13.50 32.42.37	33.14.23 32.43.10	31.13	32.58.46
Apr. 21	clariſſimo	64662 63384	32.53.15 32.27. 6	32.53.48 32.22.38	31.10	32.38.13
Apr. 22	ut antea	63842 62570	32.33.18 32. 2. 3	32.33.51 32. 2.35	31.16	32.18.13
Apr. 24	clariſſimo	62213 60965	31.53.13 31.22. 8	31.53.45 31.22.39	31. 6	31.38.12
Apr. 25	pallido	61410 60191	31.33.15 31. 2.39	31.33.46 31. 3. 9	31.37	31.18.57
Apr. 27	pallido	59870 58669	30.54.32 30.23.58	30.55. 2 30.24.27	30.35	30.39.44
Maj. 4	claro, cælo nubilo	54943 53762	28.47. 8 28.15.49	28.47.37 28.16.17	31.20	28.31.57
Maj. 5	ut antea	54286 53122	28.29.45 27.58.41	28.30.13 27.59. 8	31. 5	28.14.40
Maj. 6	ut antea	53653 52487	28.12.54 27.41.37	28.13.21 27.42.14	31. 7	27.57.47

1701		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 7	ut antea	53024 51872	27.56. 3 27.25. 0	27.56.30 27.25.26	31. 4	27.40.58
Maj. 8	clariſſimo	52412 51263	27.39.36 27. 8.28	27.40. 3 27. 8.54	31. 9	27.24.28
Maj. 9	claro, cælo nubilo	51811 50673	27.23.21 26.52.22	27.23.47 26.52.48	30.59	27. 8.17
Maj. 10	pallido	51224 50098	27. 7.24 26.36.36	27. 7.50 26.37. 1	30.49	26.52.25
Maj. 15	clariſſimo	48510 47394	25.52.41 25.21.29	25.53. 5 25.21.52	31.13	25.37.29
Maj. 20	ut antea	46129 45043	24.45.48 24.14.53	24.46.11 24.15.15	30.56	24.30.43
Maj. 22	pallido	45274 44187	24.21.32 23.50.21	24.21.54 23.50.43	31.11	24. 6.18
Maj. 23	fulgidiſſimo	44862 43789	24. 9.43 23.38.53	24.10. 5 23.39.15	30.50	23.54.40
Maj. 24	ut ſupra	44485 43386	23.58.55 23.27.14	23.59.17 23.27.35	31.42	23.43.26
Maj. 26	ut antea	43721 42648	23.36.55 23. 5.50	23.37.17 23. 6.11	31. 6	23.21.47
Maj. 27	pallidiſſimo	43358 42297	23.26.24 22.55.37	23.26.45 22.55.58	30.47	23.11.21
Maj. 28	clariſſimo	43024 41959	23.16.46 22.45.45	23.17. 7 22.46. 6	31. 1	23. 1.36
Maj. 29	Sole claro, cælo nubilo	42691 41639	23. 7. 5 22.36.23	23. 7.26 22.36.44	30.42	22.52. 5
Maj. 30	Sole clariſſimo	42384 41324	22.58. 6 22.27. 6	22.58.27 22.27.26	31. 1	22.42.56
Maj. 31	ut antea	42079 41024	22.49.15 22.18.19	22.49.36 22.18.39	30.57	22.34. 7

Jun.

1701		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 1	Sole claro, cælo nubilo	41795 40739	22.40.56 22. 9.56	22.41.17 22.10.16	31. 1	22.25.46
Jun. 2	ut antea	41513 40467	22.32.41 22. 1.55	22.33. 1 22. 2.15	30.46	22.17.38
Jun. 4	clariſſimo	41007 39967	22.17.49 21.47. 7	22.18. 9 21.47.27	30.42	22. 2.48
Jun. 5	ut antea	40781 39735	22.11.11 21.40.14	22.11.31 21.40.34	30.57	21.56. 2
Jun. 7	ut antea	40358 39313	21.58.41 21.27.41	21.59. 1 21.28. 1	31. 0	21.43.31
Jun. 8	ut antea	40168 39125	21.53. 4 21.22. 6	21.53.24 21.22.25	30.59	21.37.54
Jun. 9	pallido	39970 38954	21.47.12 21.16.58	21.47.33 21.17.18	30.15	21.32.26
Jun. 10	clariſſimo	39820 38785	21.42.44 21.11.56	21.43. 4 21.12.15	30.49	21.27.39
Jun. 11	ut antea	39668 38637	21.38.14 21. 7.30	21.38.34 21. 7.49	30.45	21.23.12
Jun. 12	ut antea	39541 38494	21.34.27 21. 3.12	21.34.47 21. 3.31	31.16	21.19. 9
Jun. 14	ut antea	39303 38269	21.27.23 20.56.29	21.27.42 20.56.48	30.55	21.12.15
Jun. 17	claro	39059 38024	21.20. 7 20.49. 7	21.20.26 20.49.26	31. 0	21. 4.56
Jun. 20	clariſſimo	38943 37900	21.16.39 20.45.23	21.16.58 20.45.42	31.16	21. 1.20
Jun. 21	ut antea	38930 37892	21.16.16 20.45.10	21.16.35 20.45.30	31. 5	21. 1. 2
Jun. 22	ut antea	38936 37903	21.16.26 20.45.30	21.16.45 20.45.50	30.55	21. 1.17

Jun.

1701		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jun. 23	ut antea	38950 37910	21.16.51 20.45.42	21.17.10 20.46. 2	31. 8	21. 1.36
Jun. 24	ut antea	38982 37937	21.17.13 20.46.31	21.17.32 20.46.50	30.42	21. 2.11
Jun. 27	ut antea	39143 38114	21.22.37 20.51.49	21.22.56 20.52. 8	30.48	21. 7.32
Jul. 2	claro	39714 38687	21.39.36 21. 9. 0	21.39.56 21. 9.19	30.37	21.24.37
Jul. 7	clariſſimo	40617 39572	22. 6.19 21.35.24	22. 6.39 21.35.44	30.55	21.51.11
Jul. 9	ut antea	41072 40031	22.19.44 21.49. 0	22.20. 4 21.49.21	30.43	22. 4.42
Jul. 11	ut antea	41587 40544	22.34.51 22. 4.11	22.35.12 22. 4.31	30.41	22.19.51
Jul. 13	languidiſſimo	42150 41102	22.51.19 22.20.37	22.51.40 22.20.57	30.43	22.36.18
Jul. 14	clariſſimo Sole	42450 41409	23. 0. 4 22.29.39	23. 0.25 22.29.59	30.26	22.45.12
Jul. 15	ut antea	42765 41722	23. 9.14 22.38.49	23. 9.35 22.39.10	30.25	22.54.22
Jul. 16	ut antea	43106 42050	23.19. 8 22.48.25	23.19.29 22.48.46	30.43	23. 4. 7
Jul. 17	claro	43442 42387	23.28.51 22.58.13	23.29.12 22.58.34	30.38	23.13.53
Jul. 19	ut antea	44172 43107	23.49.55 23.19.10	23.50.17 23.19.31	30.46	23.34.54
Jul. 20	claro	44561 43483	24. 1. 5 23.30. 3	24. 1.27 23.30.25	31. 2	23.45.56
Jul. 21	pallido	44950 43880	24.12.14 23.41.31	24.12.36 23.41.53	30.43	23.57.14

Jul.

1701		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 22	pallido	45356 44286	24.23.50 23.53.12	24.24.12 23.53.34	30.38	24. 8.53
Jul. 23	claro	45780 44708	24.35.53 24. 5.19	24.36.15 24. 5.41	30.34	24.20.58
Jul. 24	claro	46223 45135	24.48.28 24.17.31	24.48.51 24.17.53	30.58	24.33.23
Jul. 25	ut antea	46678 45579	25. 1.20 24.30.10	25. 1.43 24.30.32	31.11	24.46. 7
Jul. 27	clariſſimo	47621 46519	25.27.52 24.56.50	25.28.15 24.57.13	31. 2	25.12.44
Jul. 28	ut antea	48104 47001	25.41.22 25.10.27	25.41.46 25.10.50	30.56	25.26.18
Jul. 30	ut antea	49133 48018	26. 9.58 25.38.58	26.10.22 25.39.22	31. 0	25.54.52
Jul. 31	ut antea	49663 48543	26.24.37 25.53.37	26.25. 1 25.54. 1	31. 0	26. 9.31
Aug. 1	claro	50201 49078	26 39.26 26. 8.27	26.39.51 26. 8.51	31. 0	26.24.21
Aug. 2	ut antea	50758 49627	26.54.41 26.23.38	26.55. 7 26.24. 2	31. 5	26.39.34
Aug. 3	ut antea	51328 50197	27.10.13 26.39.19	27.10.39 26.39.44	30.55	26.55.11
Aug. 4	clariſſimo	51904 50775	27.25.52 26.55.10	27.26.18 26.55.36	30.42	27.10.57
Aug. 5	ut antea	52503 51360	27.42. 5 27.11.15	27.42.32 27.11.41	30.51	27.27. 6
Aug. 6	pallido	53102 51970	27.58.10 27.27.39	27.58.37 27.28. 5	30.32	27.43.21
Aug. 7	claro	53741 52585	28.15.15 27.44.16	28.15.42 27.44.43	30.59	28. 0.12

Aug.

1701		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ' ''	G ' ''	' ''	G ' ''
Aug. 8	clariſſimo	54365 53216	28.31.35 28. 1.13	28.32. 3 28. 1.40	30.23	28.16.51
Aug. 9	ut antea	55017 53852	28.49. 6 28.18.13	28.49.35 28.18.40	30.55	28.34. 7
Aug. 10	ut antea	55698 54510	29. 7. 2 28.35.46	29. 7.30 28.36.14	31.16	28.51.52
Aug. 11	ut antea	56364 55176	29.24.27 28.53.17	29.24.55 28.53.45	31.10	29. 9.20
Aug. 12	Sole clariſſimo	57056 55863	29.42.28 29.11.20	29.42.57 29.11.48	31. 9	29.27.22
Aug. 13	ut antea	57756 56552	30. 0.32 29.29.21	30. 1. 1 29.29.49	31.12	29.45.25
Aug. 14	ut antea. Ex ſchedis ſupputationum	58482 57270	30.19.12 29.47.58	30.19.41 29.48.27	31.14	30. 4. 4
Aug. 16	ut antea	59950 58721	30.56.34 30.25.18	30.57. 4 30.25.47	31.17	30.41.25
Aug. 17	ut antea	60711 59465	31.15.45 30.44.17	31.16.15 30.44.47	31.28	31. 0.31
Aug. 18	claro	61470 60239	31.34.45 31. 3.51	31.35.16 31. 4.21	30.55	31.19.48
Aug. 20	ut antea	63052 61800	32.13.56 31.42.59	32.14.28 31.43.30	30.58	31.58.59
Aug. 21	ut antea	63870 62601	32.33.59 32. 1.50	32.34.32 32. 2.22	32.10	32.18.27
Aug. 23	ut antea	65531 64243	33.14.14 32.43. 4	33.14.47 32.43.37	31.10	32.59.12
Aug. 24	ut antea	66388 65086	33.34.43 33. 3.31	33.35.23 33. 4.10	31.13	33.19.46
Aug. 26	ut antea	68141 66817	34.16.15 33.44.59	34.16.50 33.45.34	31.16	34. 1.12

Aug.

1701		Tangentes correctæ apenumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 27	ut antea	69033 67708	34.37. 7 34. 6. 4	34.37.43 34. 6.39	31. 4	34.22.11
Aug. 28	clariſſimo	69950 68610	34.58.27 34.27.14	34.59. 3 34.27.49	31.14	34.43.26
Aug. 29	ut antea	70884 69530	35.19.50 34.48.40	35.20.26 34.49.16	31.10	34. 4.51
Aug. 30	ut antea	71827 70458	35.41.19 35.10. 4	35.41.56 35.10.40	31.16	35.26.18
Sept. 1	clariſſimo	73760 72370	36.24.45 35.53.36	36.25.22 35.54.13	31. 9	36. 9.47
Sept. 2	ut antea	74748 73347	36.46.39 36.15.32	36.47.18 36.16. 9	31. 9	36.31.43
Sept. 3	ut antea	75758 74333	37. 8.48 36.37.27	37. 9.27 36.38. 5	31.22	36.53.46
Sept. 4	ut antea	76764 75325	37.30.41 36.59.31	37.31.21 37. 0.10	31.11	37.15.45
Sept. 7	claro	79900 78433	38.37.33 38. 6.29	38.38.15 38. 7.10	31. 5	38.22.42
Sept. 8	clariſſimo	80992 79491	39. 0.17 38.28.54	39. 1. 0 38.29.36	31.24	38.45.18
Sept. 9	clariſſimo	82092 80578	39.23. 0 38.51.40	39.23.43 38.52.23	31.20	39. 8. 3
Sept. 11	pallido	84324 82788	40. 8.20 39.37.13	40. 9. 4 39.37.57	31. 7	39.53.30
Sept. 12	clariſſimo	85476 83911	40.31.20 40. 0. 1	40.32. 5 40. 0.45	31.20	40.16.25
Sept. 14	ut antea	87817 86219	41.17.19 40.46. 2	41.18. 5 40.46.49	31.16	41.21.27
Sept. 15	ut antea	89025 87397	41.40.37 41. 9. 9	41.41.25 41. 9.55	31.30	41.25.40

1701		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 16	Sole clariſſimo	90233 88601	42. 3.39 41.32.29	42. 4.26 41.33.16	31.10	41.48.51
Sept. 17	ut antea	91466 89808	42.26.52 41.55.35	41.27.39 41.56.22	31.17	42.12. 0
Sept. 19	ut antea	93990 92289	43.13.32 42.42.13	43.14.21 42.43. 1	31.20	42.58.41
Sept. 20	ut antea	95285 93555	43.37. 1 43. 5.34	43.37.51 43. 6.23	31.28	43.22. 7
Sept. 21	claro, cælo nubilo	96597 94844	44. 0.30 43.29. 3	44. 1.21 43.29.53	31.28	43.45.37
Sept. 22	Sole ſatis claro, cælo nubilo	97914 96141	44.23.46 43.52.23	44.24.37 43.53.24	31.13	44. 9. 0
Sept. 23	ut antea	99244 97474	44.46.57 44.16. 2	44.47.49 44.16.53	30.56	44.32.21
Sept. 24	clariſſimo	100617 98798	45.10.33 44.39.13	45.11.25 44.40. 5	31.20	44.55.45
Sept. 25	ut antea	102107 100155	45.35. 5 45. 2.40	45.35.37 45. 3.32	32. 5	45.19.34
Sept. 26	languido	103418 101528	45.57.45 45.26. 4	45.58.37 45.26.55	31.42	45.42.46
Sept. 28	clariſſimo	106272 104345	46.44.30 46.13. 5	46.45.26 46.13.59	31.27	46.29.42
Sept. 29	ut antea	107728 105772	47. 7.50 46.36.24	47. 8.46 46.37.19	31.27	46.53. 2
Oct. 1	claro	110725 108717	47.54.49 47.23.30	47.55.47 47.24.27	31.20	47.40. 7
Oct. 13	pallido	130356 127922	52.30.25 51.59. 4	52.31.34 52. 0.11	31.23	52.15.52
Oct. 17	claro	137639 135026	54. 0. 1 53.28.35	54. 1.13 53.29.46	31.27	53.45.29

Mar.

1701		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 18	clariſſimo	139515 136848	54.22. 6 53.50.35	54.23.19 53.51.47	31.32	54. 7.33
Oct. 20	ut antea	143293 140524	55. 5.24 54.33.44	55. 6.39 54.34.58	31.41	54.50.48
Oct. 21	ut antea	145212 142384	55.26.49 54.55. 7	55.28. 6 54.56.22	31.44	55.12.14
Oct. 22	pallido	147127 144286	55.47.48 55.16.31	55.49. 6 55.17.47	31.19	55.33.26
Oct. 23	clariſſimo	149108 146190	56. 9. 7 55.37.35	56.10.26 55.38.53	31.33	55.54.39
Oct. 24	pallido	151121 148156	56.30.23 55.58.56	56.31.44 56. 0.15	31.29	56.15.59
Oct. 25	clariſſimo	153131 150099	56.51.14 56.19.39	56.52.36 56.20.59	31.37	56.36.47
Oct. 27	clariſſimo	157229 154066	57.32.35 57. 0.48	57.33.59 57. 2.10	31.49	57.18. 4
Oct. 28	ut antea	159315 156077	57.53. 2 57.21. 7	57.53.28 57.21.30	31.58	57.37.29
Oct. 30	raptim inter nubes	163450 160167	58.32.29 58. 1.17	58.33.57 58. 2.43	31.14	58.18.20
Oct. 31	Sole pallido	165576 162208	58.52.12 58.20.47	58.53.41 58.22.14	31.27	58.37.57
Nov. 1	Sole claro	167718 164260	59.11.42 58.40. 2	59.13.12 58.41.31	31.41	58.57.21
Nov. 2	ut antea	169863 166338	59.30.52 58.59.17	59.32.24 59. 0.47	31.37	59.16.35
Nov. 3	ut antea	171999 168418	59.49.35 59.17.59	59.51. 8 59.19.30	31.38	59.35.19
Nov. 4	ut antea	174189 170527	60. 8.25 59.36.43	60.10. 9 59.38.15	31.54	59.54.12

		Tangentes correctæ a penumbra	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
1701			G ′ ″	G ′ ″	′ ″	G ′ ″
Nov. 9	claro	185186 18118[illegible]	61.37.52 61. 6. 7	61.39.3[illegible] 61. 7.56	31.37	61.23.44
Nov. 12	pallido	191821 187568	62.27.50 61.56.10	62.29.3[illegible] 61.57.53	31.41	62.13.43
Nov. 16	clariſſimo	200764 196087	63.30.27 62.58.46	63.32.16 63. 0 32	31.44	63.16.24
Nov. 20	clariſſimo	209327 204439	64.27.55 63.56. 5	64 29.49 63.57.56	31.53	64.13.52
Nov. 24	ut antea	217633 212429	65.19.18 64.47 29	65.21.16 64.49.25	31.51	65. 5.20
Nov. 25	ut antea	219653 214355	65.31.49 64.59.25	65.33.49 65. 1.22	32.27	65.17.35
Nov. 27	clariſſimo	223546 218095	65.53.58 65.22. 4	65.56. 0 65.24. 3	31.57	65.40. 1
Nov. 29	claro	227309 221689	66.15.14 65.43.15	66.17.19 65.45.16	32. 3	66. 1.17
Dec. 1	clariſſimo	230930 225089	66.35. 9 66. 2.45	66.37.16 66. 4.48	32.28	66.21. 2
Dec. 7	ut antea	239994 233854	67.22.47 66.50.51	67.24.59 66.52.59	32. 0	67. 8.59
Dec. 8	claro	241269 235067	67.29.14 66.57.16	67.31.26 66.59.25	32. 1	67.15.25
Dec. 10	claro, cælo nubilo	243603 237301	67.40.54 67. 8.57	67.43. 8 67.11. 7	32. 1	67.27. 7
Dec. 13	ſubpallido	246478 240025	67.55. 1 67.22.57	67.57.17 67.25. 8	32. 9	67.41.12
1702						
Jan. 1	clariſſimo Sole	244632 238268	67.45.59 67.13.56	67.48.13 67.16. 7	32. 6	67.32.10

Jan.

1702		Tangentes correcte a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jan. 2	ut ſupra	243599 237282	67.40.53 67. 8.52	67.43. 7 67.11. 2	32. 5	67.27. 4
Jan. 4	claro, cælo nubilo	241269 235079	67.29.14 66.57.21	67.31.26 66.59.30	31.56	67.15.28
Jan. 8	clariſſimo	235747 229740	67. 0.51 66.28.40	67. 3. 0 66.30.46	32.14	66.46.53
Jan. 10	ut antea	232496 226690	66.43.36 66.11.47	66.45.43 66.13.51	31.52	66.29.47
Jan. 22	Sole claro, cælo nubilo	209257 204323	64.27.28 63.55.19	64.29.22 63.57.10	32.12	64.13.16
Jan. 23	clariſſimo	207062 202259	64.13.19 63.41.30	64.15.11 63.43.21	31.50	63.59.16
Jan. 24	ut antea	204896 200168	63.59. 6 63.27.15	64. 0.58 63.29. 3	31.55	63.45. 0
Jan. 28	Sole clariſſimo	196027 191652	62.58.20 62.26.44	63. 0. 6 62.28.28	31.38	62.44.17
Jan. 30	clariſſimo	191614 187365	62.26.26 61.54.37	62.28.10 61.56.20	31.50	62.12.15
Jan. 31	clariſſimo	189410 185199	62.10. 5 61.37.58	62.11.48 61.39.39	32. 9	61.55.44
Feb. 1	ut antea	187156 183050	61.53. 2 61.21. 8	61.54.44 61.22.48	31.56	61.38.46
Feb. 4	ut antea	180491 176614	61. 0.42 60.28.52	61. 2.20 60.30.28	31.52	60.46.24
Feb. 5	claro	178253 174454	60.42.27 60.10.42	60.44. 4 60.12.17	31.47	60.28.11
Feb. 6	clariſſimo	176070 172329	60.24.19 59.52.27	60.25.55 59.54. 1	31.54	60. 9.58
Feb. 7	ut antea	173852 170192	60. 5.33 59.33.46	60. 7. 7 59.35.18	31.49	59.51.13

Feb.

1702		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 8	ut antea	171681 168090	59.46.49 59.15. 3	59.48.22 59.16.34	31.48	59.32.28
Feb. 9	clariſſimo	169523 165991	59.27.50 58.56. 1	59.29.22 58.57.31	31.51	59.13.27
Feb. 10	ut antea	167362 163909	59. 8.29 58.36.46	59.10. 0 58.38.14	31.46	58.54. 7
Feb. 11	ut antea	165216 161836	58.48.53 58.17.15	58.50.22 58.18.42	31.40	58.34.32
Feb. 12	ut antea	163088 159772	58.29. 5 57.57.29	58.30.33 57.58.55	31.38	58.14.44
Feb. 14	ut antea	158911 155680	57.49. 6 57.17. 8	57.50.31 57.18.31	32. 0	57.34.31
Feb. 26	clariſſimo	135264 132666	53.31.29 52.59.32	53.32.41 53. 0.44	31.57	53.16.42
Feb. 27	ut antea	137422 130879	53. 8.54 52.37. 5	53.10. 4 52.38.14	31.50	52.54. 9
Mar. 1	ut antea	129822 127374	52.23.36 51.51.54	52.24.44 51.53. 1	31.43	52. 8.52
Mar. 3	claro	126297 123949	51.37.42 51. 6.15	51.38.48 51. 7.19	31.29	51.23. 4
Mar. 9	pallido	116274 114209	49.18.11 48.47.42	49.19.12 48.48.42	30.30	49. 3.57
Mar. 10	claro	114712 112609	48.55.11 48.23.38	48.56.10 48.24.36	31.34	48.40.23
Mar. 11	claro	113139 111074	48.31.39 48. 0.12	48.32.38 48. 1.10	31.28	48.16.54
Mar. 12	clariſſimo	111602 109558	48. 8.18 47.36.41	48. 9.16 47.37.38	31.38	47.53.27
Mar. 14	ut antea	108563 106576	47.21. 4 46.49.29	47.22. 1 46.50.20	31.41	47. 6.10

Mar.

1702		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 15	ut antea	107079 105121	46.57.29 46.25.48	46.58.25 46.26.43	31.42	46.42.34
Mar. 16	ut antea	105618 103683	46.33.53 46. 2. 9	46.34.48 46. 3. 3	31.45	46.18.55
Mar. 19	cælo nubilo	101333 99488	45.22.46 44.51.10	45.23.39 44.52. 2	31.37	45. 7.50
Mar. 21	cælo ſereno	98578 96791	44.35.23 44. 3.55	44.36.14 44. 4.45	31.29	44.20.30
Mar. 22	clariſſimo	97231 95455	44.11.44 43.40. 4	44.12.35 43.40.54	31.41	43.56.45
Mar. 23	pallido	95894 94174	43.47.57 43.16.53	43.48.48 43.17.43	31. 5	43.33.16
Mar. 24	clariſſimo	94586 92865	43.24.23 42.52.52	43.25.13 42.53.41	31.32	43. 9.27
Mar. 26	ut antea	92022 90250	42.37.16 42. 3.59	42.38. 4 42. 4.46	33.18	
Mar. 29	ut antea	88324 86706	41.27. 8 40.55 38	41.27.55 40.56.24	31.31	41.12.10
Mar. 30	ut antea	87133 85527	41. 4. 0 40.32.22	41. 4.46 40.33. 7	31.39	40.48.56
Mar. 31	ut antea	85950 84362	40.40.45 40. 9. 5	40.41.30 40. 9.49	31.41	40.25.40
Apr. 1	claro	84772 83232	40.17.19 39.46.17	40.18. 4 39.47. 1	31. 3	40. 2.33
Apr. 2	ut antea	83621 82087	39.54.10 39.22.54	39.54.54 39.23.37	31.17	39.39.16
Apr. 3	ut antea	82484 80974	39.31. 1 38.59.55	39.31.45 39. 0.38	31. 7	39.16.11
Apr. 4	clariſſimo	81376 79882	39. 8.15 38.37. 6	39. 8.58 38.37.48	31.10	38.53.23

Apr.

1702		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Apr. 5	pallido	80286 78802	38.45.35 38.14.20	38.46.18 38.15. 1	31.17	38.30.40
Apr. 7	claro	78132 76690	38. 0. 4 37.29. 5	38. 0.45 37.29.44	31. 1	37.45.15
Apr. 10	clariſſimo	75050 73631	36.53.17 36.21.52	36.53.56 36.22.30	31.26	36.38.13
Apr. 12	pallido	73068 71672	36. 9.17 35.37.48	36. 9.54 35.38.24	31.30	35.54. 9
Apr. 14	clariſſimo	71133 69773	35.25.31 34.54.17	35.26. 7 34.54.52	31.15	35.10.30
Apr. 16	ut antea	69271 67933	34.42.39 34.11.22	34.43.15 34.11.57	31.18	34.27.36
Apr. 20	ut antea	65731 64430	33.19. 3 32.47.37	33.19.37 32.48.10	31.27	33. 3.54
Apr. 21	pallido	64864 63601	32.58. 9 32.27.25	32.58.41 32.27.57	30.44	32.43.19
Apr. 22	claro	64033 62765	32.37.57 32. 6.52	32.38.30 32. 7.24	31. 6	32.22.56
Maj. 2	nubilo	56454 55266	29.26.47 28.55.39	29.27.15 28.56. 7	31. 8	29.11.41
Maj. 9	pallido	51950 50814	27.27. 6 26.56.13	27.27.32 26.56.39	30.53	27.12. 6
Maj. 11	claro	50794 49666	26.55.41 26.24.42	26.56. 7 26.25. 7	31. 0	26.40.37
Maj. 12	clariſſimo	50237 49111	26.40.25 26. 9.22	26.40.50 26. 9.46	31. 4	26.25.18
Maj. 18	ut antea	47154 46059	25.14.45 24.43.50	25.15. 8 24.44.13	30.55	24.59.41
Maj. 19	Sole clariſſimo	46692 45600	25. 1.43 24.30.46	25. 2. 6 24.31. 9	30.57	24.46.38

Maj.

1702		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 23	ut antea	44963 43886	24.12.37 23.41.41	24.12.59 23.42. 3	30.56	23.57.31
Maj. 25	claro	44180 43103	23.50. 9 23.19. 3	23.50.31 23.19.24	31. 7	23.34.58
Maj. 26	ut antea	43802 42737	23.39.15 23. 8.26	23.39.37 23. 8.47	30.50	23.24.12
Jun. 1	clariſſimo	41849 40808	22.42.32 22.11.58	22.42.53 22.12.18	30.35	22.27.36
Jun. 10	ut antea	39859 38818	21.43.55 21.12.55	21.44.15 21.13.14	31. 1	21.28.45
Jun. 12	ut antea	39567 38530	21.35.14 21. 4.18	21.35.34 21. 4.37	30.57	21.20. 5
Jun. 21	claro	38928 37883	21.16.12 20.44.53	21.16.31 20.45.13	31.18	21. 0.52
Jun. 22	clariſſimo	38935 37895	21.16.25 20.45.15	21.16.44 20.45.34	31.10	21. 1. 9
Jun. 23	ut antea	38938 37899	21.16.30 20.45.22	21.16.49 20.45.42	31. 7	21. 1.15
Jun. 25	ut antea	39007 37974	21.18.34 20.47.38	21.18.53 20.47.57	30.56	21. 3.25
Jun. 26	ut antea	39061 38020	21.20.11 20.49. 0	21.20.30 20.49.19	31.11	21. 4.54
Jun. 27	claro	39131 38093	21.22.16 20.51.12	21.22.35 20.51.31	31. 4	21. 7. 3
Jul. 1	claro	39541 38501	21.34.27 21. 3.25	21.34.47 21. 3.44	31. 3	21.19.15
Jul. 5	ut antea	39994 38954	21.47.55 21.16.58	21.48.16 21.17.17	30.59	21.32.47
Jul. 10	clariſſimo	41258 40206	22.25.12 21.54.11	22.25.32 21.54.31	31. 1	22.10. 2

1702		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 11	ut antea	41524 40473	22.33. 0 22. 2. 6	22.33.21 22. 2.26	30.55	22.17.54
Jul. 13	ut antea	42079 41023	22.49.15 22.18.18	22.49.36 22.18.38	30.58	22.34. 7
Jul. 14	ut antea	42 83 41321	22.58. 7 22.27. 4	22.58.28 22.27.25	31. 3	22.42.57
Jul. 18	ut antea	43705 4265[illegible]	23.36.27 23. 5.53	23.36.49 23. 6.14	30.35	23.21.32
Jul. 22	ut antea	45261 44172	24.21. 7 23.49.55	24.21.[illegible]9 23.50.17	31.12	24. 5.53
Jul. 26	ut antea	47024 45922	25.11. 0 24.39.57	25.11.24 24.40.20	31. 4	24.55.52
Jul. 27	ut antea	47498 46398	25.24.25 24.53.25	25.24.48 24.53.48	31. 0	25. 9.18
Jul. 29	ut antea	48491 47380	25.52. 9 25.21. 5	25.52.33 25.21.28	31. 5	25.37. 1
Jul. 30	ut antea	48999 47891	26. 6.16 25.35.25	26. 6.40 25.35.49	30.51	25.51.15
Aug. 1	ut antea	50064 48944	26.35.40 26. 4.45	26.36. 5 26. 5. 9	30.56	26.20.37
Aug. 3	Sole clariſſimo	51172 50050	27. 5.58 26.35.17	27. 6.24 26.35.42	30.42	26.51. 3
Aug. 5	ut antea	52354 51206	27.38. 2 27. 6.59	27.38.29 27. 7.25	31. 4	27.22.57
Aug. 6	ut antea	52955 51813	27.54.13 27.23.24	27.54.40 27.23.50	30.50	27.39.15
Aug. 8	clariſſimo, ſpecie tremula	54210 53055	28.27.44 27.56.54	28.28.11 27.57.21	30.50	28.12.46
Aug. 10	Sole claro cælo nubilo	55526 54329	29. 2.30 28.30.54	29. 2.58 28.31.22	31.36	28.47.10

Aug.

1702		Tangentes correctæ a penumbra	Dist. a vertice apparens limborum	Dist. a vertice vera limborum	Diam. app. Solis	Dist. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 11	ut antea	56234 55002	29.21. 3 28.48.43	29.21.31 28.49.11	32.20	29. 5.21
Aug. 12	pallido	56884 55687	29.38. 0 29. 6.44	29.38.29 29. 7.12	31.17	29.22.51
Aug. 13	pallido	57568 56386	29.55.42 29.25. 2	29.56.11 29.25.30	30.41	29.40.51
Aug. 14	claro	58277 57088	30.13.57 29.43.18	30.14.26 29.43.47	30.39	29.59. 7
Aug. 15	clariſſimo	59018 57806	30.32.54 30. 1.51	30.33.24 30. 2.20	31. 4	30.17.52
Aug. 16	claro	59752 58539	30.51.33 30.20.40	30.52. 3 30.21. 9	30.54	30.36.36
Aug. 17	claro	60516 59283	31.10.50 30.39.38	31.11.20 30.40. 8	31.12	30.55.44
Aug. 22	ut antea	64495 63221	32.49.12 32.18. 6	32.49.45 32.18.38	31. 7	32.34.12
Aug. 23	ut antea	65327 64050	33. 9.19 32.38.22	33. 9.52 32.38.55	30.57	32.54.24
Aug. 24	ut antea	66177 64877	33.29.43 32.58.28	33.30.16 32.59. 1	31.15	33.14.39
Aug. 25	Sole pallido	67038 65741	33.50.14 33.19.17	33.50.49 33.19.50	30.59	33.35.20
Aug. 27	ut antea	68818 67501	34.32. 6 34. 1.11	34.32.42 34. 1.46	30.56	34.17.14
Aug. 29	pallido	70653 69297	35.14.37 34.43.15	35.15.13 34.43.51	31.22	34.59.32
Aug. 30	pallido	71592 70226	35.35.59 35. 4.44	35.36.35 35. 5.19	31.16	35.20.57
Aug. 31	claro	72555 71167	35.57.46 35.26.18	35.58.23 35.26.53	31.30	35.42.38

1702		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 1	claro	73528 72125	36.19.35 35.48. 4	36.20.12 35.48.41	31.31	36. 4.27
Sept. 3	fulgidiſſimo	75498 74087	37. 3. 8 36.32. 1	37. 3.47 36.32.39	31. 8	36.48.13
Sept. 7	ut antea	79649 78177	38.32.13 38. 1. 3	38.32.55 38. 1.44	31.11	38.17.19
Sept. 8	pallido	80726 79244	38.54.45 38.23.41	38.55.28 38.24.22	31. 6	38.39.55
Sept. 9	claro	81815 80309	39.17.18 38.46. 4	39.18. 1 38.46.47	31.14	39. 2.24
Sept. 10	claro	82935 81407	39.40.15 39. 8.53	39.40.59 39. 9.36	31.23	39.25.18
Sept. 13	Sole clariſſimo	86359 84784	40.48.49 40.17.34	40.49.35 40.18.18	31.17	40.33.57
Sept. 14	ut antea	87531 85930	41.11.46 40.40.21	41.12.32 40.41. 6	31.26	40.56.49
Sept. 17	claro	91164 89514	42.21.12 41.49.59	42.22. 0 41.50.47	31.13	42. 6.24
Sept. 18	ut antea	92406 90747	42.44.23 42.13.22	42.45.12 42.14.10	31. 2	42.29.41
Sept. 20	clariſſimo	94970 93254	43.31.21 43. 0. 3	43.32.11 43. 0.52	31.19	43.16.32
Sept. 23	claro	98950 97149	44.41.52 44.10.17	44.42.44 44.11. 8	31.36	44.26.56
Sept. 24	ut antea	100300 98471	45. 5. 9 44.33.31	45. 6. 1 44.34.23	31.38	44.50.12
Sept. 25	ut antea	101683 99823	45.28.41 44.56.57	45.29.34 44.57.49	31.45	45.13.42
Sept. 26	ut antea	103076 101209	45.52. 5 45.20.39	45.52.59 45.21.31	31.28	45.37.15

Sept.

1702		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 27	ut antea	104507 102594	46.15.46 45.44. 1	46.16.40 45.44.54	31.46	46. 0.47
Sept. 28	ut antea	105923 104004	46.38.51 46. 7.28	46.39.46 46. 8.22	31.24	46.24. 4
Sept. 29	ut antea	107399 105447	47. 2.35 46.31. 8	47. 3.31 46.32. 3	31.28	46.47.47
Sept. 30	ut antea	108903 106889	47.26.25 46.54.25	47.27.22 46.55.21	32. 1	47.11.21
Oct. 1	pallido	110372 108355	47.49.21 47.17.47	47.50.19 47.18.44	31.35	47.34.31
Oct. 2	claro	111882 109871	48.12.35 47.41.34	48.13.33 47.42.28	31. 5	47.58. 1
Oct. 3	claro	113424 111356	48.35.56 48. 4.32	48.36.55 48. 5.30	31.25	48.21.13
Oct. 5	claro	116556 114426	49.22.19 48.50.56	49.23.20 48.51.56	31.24	49. 7.38
Oct. 6	pallido	118161 115978	49.45.31 49.13.52	49.46.33 49.14.52	31.41	49.30.42
Oct. 9	claro	123091 120789	50.54.33 50.22.43	50.55.39 50.23.47	31.52	50.39.43
Oct. 10	pallido	124773 122459	51.17.22 50.45.53	51.18.17 50.46.57	31.30	51. 2.42
Oct. 22	claro	146691 143838	55.43. 3 55.11.31	55.44.19 55.12.46	31.33	55.28.33
Oct. 24	claro	150652 147692	56.25.28 55.53.55	56.26.48 55.55.14	31.34	56.11. 1
Oct. 26	pallido	154693 151607	57. 7.12 56.35.28	57. 8.30 56.36.49	31.45	56.52.42
Oct. 30	clariſſimo	162990 159691	58.28.10 57.56.41	58.29.38 57.58. 7	31.31	58.13.53

Oct.

1702		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 31	ut antea	165076 161740	58.47.36 58.16.21	58.49. 5 58.17.48	31.17	58.33.25
Nov. 5	ut antea	175881 172157	60.22.44 59.50.57	60.24.20 59.52.30	31.50	60. 8.25
Nov. 16	Sole clariſſimo	200143 195612	63.27. 5 62.55.23	63.28.53 62.57. 9	31.44	63.13. 1
Nov. 17	ut antea. Hæc obſervatio deſcripta eſt a ſchedis ſupputationum diurnalium, nam in adverſ. meis deſideratur	202340 197706	63.42. 2 63.10.11	63.43.52 63.11.58	31.54	63.27.55
Nov. 19	ut antea	206686 201876	64.10.52 63.38.54	64.12.44 63.40.43	32. 1	63.56.44
Nov. 22	ut antea	213077 208017	64.51.31 64.19.30	64.53.30 64.21.23	32. 7	64.37.26
Nov. 23	ut antea	215123 209997	65. 4. 7 64.32.11	65. 6. 4 64.34. 5	31.59	64.50. 4
Nov. 24	ut antea	217151 211979	65.16.25 64.44.41	65.18.24 64.46.37	31.47	65. 2.31
Dec. 18	Sole claro	249300 242719	68. 8.35 67.36.30	68.10.52 67.38.43	32. 9	67.54.48
Dec. 19	ut antea	249701 243027	68.10.30 67.38. 2	68.12.49 67.40.15	32.34	67.56.32
Dec. 25	clariſſimo	249493 242895	68. 9.30 67.37.22	68.11.47 67.39.36	32.11	67.55.42
Dec. 26	pallido	249107 242522	68. 7.40 67.35.31	68. 9.57 67.37.44	32.13	67.53.50
Dec. 27	clariſſimo	248635 242087	68. 5.25 67.33.21	68. 7.42 67.35.34	32. 8	67.51.38
Dec. 28	ut antea	248085 241559	68. 2.46 67.30.42	68. 5. 2 67.32.55	32. 7	67.48.59

Dec.

1702		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Dec. 29	ut antea	247425 240903	67.59.35 67.27.23	68. 1.51 67.29.35	32.16	67.45.43
Dec. 31	pallido	245837 239385	67.51.53 67.19.41	67.54. 8 67.21.52	32.16	67.38. 0
1703						
Jan. 2	Luna hac noςte obſervata eſt in meridiana, hora 11.44 3 poſt mer. Tangentes in correςtæ 42122, 41030					
Jan. 8	Sole clariſſimo	236095 230100	67. 2.40 66.30.39	67. 4.49 66.32.45	32. 4	66.48.47
Jan. 9	Sole claro	234550 228604	66.54.33 66.22.25	66.56.42 66.24.30	32.12	66.40.36
Jan. 10	pallido	232929 227068	66.45.56 66.13.53	66.48. 4 66.15.57	32. 7	66.32. 1
Jan. 11	claro	231243 225444	66.36.51 66. 4.46	66.38.58 66. 6.50	32. 8	66.22.54
Jan. 29	pallido	194377 190022	62.46.33 62.14.39	62.48.18 62.16.22	31.56	62.32.20
Jan. 30	claro	192150 187879	62.30.23 61.58.32	62.32. 7 62. 0.10	31.57	62.16. 8
Jan. 31	claro	189935 185705	62.14. 0 61.41.53	62.15.43 61.43.55	32. 8	61.59.39
Feb. 1	claro	187699 183574	61.57.10 61.25.16	61.58.52 61.26.56	31.56	61.42.54
Feb. 2	claro	185468 181423	61.40. 3 61. 8.12	61.41.4[illegible] 61. 9.51	31.53	61.25.48
Feb. 3	claro	183232 179261	61.22.34 60.50.43	61.24.14 60.52.21	31.53	61. 8.18

1703		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Feb. 4	Sole pallido	181031 177127	61. 5. 3 60.33. 9	61. 6.41 60.34.45	31.56	60.50.43
Feb. 13	Sole obnubilato ſpecie tremula	161516 158231	58.14.13 57.42.28	58.15.40 57.43.53	31.47	57.59.47
Feb. 17	Sole claro ſpecie tremula	153203 150129	56.51.57 56.19.57	56.53.18 56.21.17	32. 1	56.37.18
Feb. 18	ut antea	151164 148175	56.30.43 55.59. 8	56.32. 4 56. 0.27	31.37	56.16.17
Feb. 19	ut antea	149170 146200	56. 9.47 55.37.41	56.11. 7 55.39. 0	32. 7	55.55. 4
Feb. 21	Sole claro	145194 142373	55.26.37 54.54.59	55.27.54 54.56.14	31.40	55.12. 4
Mar. 3	Sole claro	126738 124355	51.43.32 51.11.44	51.44.38 51.12.49	31.49	51.28.44
Mar. 4	ut antea	125014 12267[illegible]	51.20.36 50.48.49	51.21.41 50.49.54	31.47	51. 5.48
Mar. 6	pallido	121627 119367	50.34.24 50. 2.43	50.35.28 50. 3.46	31.42	50.19.37
Mar. 9	pallido	116669 114549	49.23.58 48.52.46	49.24.59 48.53.46	31.13	49. 9.22
Mar. 10	claro	115109 112996	49. 1. 4 48.29.30	49. 2. 4 48.30.29	31.35	48.46.16
Mar. 13	claro	110468 108421	47.50.51 47.18.50	47.51.49 47.19.47	32. 2	47.35.48
Mar. 17	Sole languido	104513 102613	46.15.51 45.44.20	46.16.46 45.45.13	31.33	46. 1. 0
Mar. 18	claro	103105 101198	45.52.33 45.20.28	45.53.27 45.21.21	32. 6	45.37.24
Mar. 19	clariſſimo	101679 99817	45.28.37 44.56.51	45.29.29 44.57.43	31.46	45.13.36

Mar.

1703		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Mar. 21	ut antea	98912 97099	44.41.12 44. 9.24	44.42. 4 44.10.15	31.49	44.26.10
Mar. 22	ut antea	97568 95781	44.17.42 43.45.57	44.18.33 43.46.47	31.46	44. 2.39
Mar. 23	ut antea	96231 94410	43.53.50 43.22. 6	43.54.41 43.22.55	31.46	43.38.48
Mar. 24	ut antea	94916 93166	43.30.22 42.58.26	43.31.12 42.59.15	31.57	43.15.13
Mar. 28	ut antea, e ſchedis diurnalium ſupputationum	89841 88191	41.56.12 41.24.33	41.57. 0 41.25.19	31.41	41.41. 9
Mar. 29	clariſſimo	88624 86993	41.32.55 41. 1.15	41.33.42 41. 2. 1	31.41	41.17.51
Mar. 30	ut antea	87423 85802	41. 9.39 40.37.49	41.10.25 40.38.34	31.51	40.54.30
Apr. 5	ut antea	80563 79063	38.51.21 38.19.51	38.52. 4 38.20.32	31.32	38.36.18
Apr. 7	ut antea	78416 76940	38. 6. 8 37.34.30	38. 6.49 37.35.10	31.39	37.51. 0
Apr. 9	ut antea, e ſchedis ſupputationum	76327 74883	37.21.12 36.49.37	37.21.52 36.50.16	31.36	37. 6. 4
Apr. 11	ut antea	74302 72882	36.36.47 36. 5. 7	36.37.25 36. 5.44	31.41	36.21.35
Apr. 12	Sole claro	73319 71915	36.14.55 35.43.19	36.15.32 35.43.55	31.37	35.59.44
Apr. 13	claro	72342 70945	35.52.57 35.21.14	35.53.34 35.21.49	31.45	35.37.41
Apr. 16	ut antea	69496 68154	34.47.49 34.16.33	34.48.25 34.17. 8	31.17	34.32.47
Apr. 17	ut antea	68593 67258	34.26.50 33.55.27	34.27.25 33.56. 2	31.23	34.11.44

1703		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 18	ut antea	67700 66365	34. 5.53 33.34.13	34. 6.28 33.34.47	31.41	33.50.37
Apr. 19	ut antea	66801 65493	33.44.36 33.13.19	33.45.10 33.13.52	31.18	33.29.31
Apr. 20	ut antea	65930 64632	33.23.49 32.52.31	33.24.22 33.53. 4	31.18	33. 8.43
Apr. 22	pallido	64229 62969	32.42.44 32.11.54	32.43.17 32.12.26	30.51	32.27.52
Apr. 23	claro, cælo nubilo	63410 62156	32.22.44 31.51.48	32.23.16 31.52.20	30.56	32. 7.48
Apr. 24	nubilo	62584 61356	32. 2.25 31.31.54	32. 2.56 31.32.25	30.31	31.47.40
Apr. 25	nubilo	61803 60581	31.43. 3 31.12.29	31.43.34 31.12.59	30.35	31.28.17
Maj. 1	Sole claro	57315 56121	29.49. 9 29.18. 5	29.49.38 29.18.33	31. 5	29.34. 5
Maj. 2	pallidiſſimo	56605 55445	29.30.43 29. 0.22	29.31.12 29. 0.50	30.22	29.16. 1
Maj. 3	claro	55922 54757	29.12.54 28.42.14	29.13.22 28.42.42	30.40	28.58. 2
Maj. 5	claro	54600 53440	28.38. 5 28. 7.12	28.38.33 28. 7.39	30.54	28.23. 6
Maj. 10	claro	51514 50375	27.15.18 26.44.12	27.15.44 26.44.37	31. 7	27. 0.11
Maj. 18	languido. Per hoſce dies cum eſſet Bononiæ Maraldus mecum interdum, vel cum Stancario, obſervationes habebat	47263 46169	25.17.49 24.46.57	25.18.11 24.47.20	30.51	25. 2.46

Maj.

1703		*Tangentes correctæ apenumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Maj. 21	claro	45902 44813	24.39.22 24. 8.19	24.39.45 24. 8.41	31. 4	24.24.13
Maj. 29	claro	42844 41788	23.11.35 22.40.38	23.11.56 22.40.59	30.57	22.56.28
Maj. 30	claro	42542 41458	23. 2.45 22.31. 5	23. 3. 6 22.31.26	31.40	22.47.16
Jun. 1	nubilo	41929 40878	22.44.53 22.14. 2	22.45.14 22.14.22	30.52	22.29.48
Jun. 2	ſubnubilo	41640 40595	22.36.25 22. 5.41	22.36.46 22. 6. 1	30.45	22.21.24
Jun. 15	claro	39242 38204	21.25.34 20.54.32	21.25.53 20.54.51	31. 2	21.10.22
Jun. 22	clariſſimo	38930 37894	21.16.16 20.45.13	21.16.35 20.45.32	31. 3	21. 1. 4
Jun. 23	cælo ſubnubilo	38936 37901	21.16.26 20.45.24	21.16.45 20.45.43	31. 2	21. 1.14
Jun. 26	claro	39052 38012	21.19.55 20.48.46	21.20.14 20.49. 5	31. 9	21. 4.40
Jun. 27	Sole claro, cælo nubilo	39117 38079	21.21.51 20.50.47	21.22.10 20.51. 6	31. 4	21. 6.38
Jun. 28	Sole languido	39187 38155	21.23.55 20.53. 4	21.24.14 20.53.23	30.51	21. 8.49
Jul. 4	Sole claro	39950 38912	21.46.36 21.1[illegible].4[illegible]	21.46.57 21.16. 3	30.54	21.31.30
Jul. 10	claro	41192 40152	22.23.16 21.52.35	22.23.36 21.52.56	30.40	22. 8.16
Jul. 16	claro	42939 41883	23.14.18 22.43.32	23.14.40 22.43.53	30.47	22.59.17
Jul. 17	ut antea	43278 42220	23.24. 8 22.53.22	23.24.29 22.53.43	30.46	23. 9. 6

1703		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jul. 20	ut antea	44364 43298	23.55.26 23.24.42	23.55.48 23.25. 3	30.45	23.40.26
Jul. 21	claro	44756 43680	24. 6.41 23.35.45	24. 7. 3 23.36. 7	30.56	23.51.35
Aug. 9	claro	54710 53538	28.40.58 28. 9.49	28.41.26 28.10.16	31.10	28.25.51
Aug. 10	ut antea	55356 54179	28.58. 2 28.26.54	28.58.31 28.27.21	31.10	28.42.56
Aug. 20	Sole claro, cælo nubilo	62668 61409	32. 4.29 31.33.16	32. 5. 1 31.33.47	31.14	31.49.24
Aug. 26	clariſſimo	67708 66390	34. 6. 4 33.34.49	34. 6.39 33.35.23	31.16	33.51. 1
Aug. 27	ut antea	68600 67272	34.27. 0 33.55.46	34.27.35 33.56.21	31.14	34.11.58
Aug. 28	ut antea	69510 68162	34.48.11 34.16.45	34.48.46 34.17.20	31.26	34.33. 3
Aug. 29	ut antea	70430 69075	35. 9.25 34.38. 6	35.10. 0 34.38.41	31.19	34.54.21
Aug. 31	ut antea	72315 70936	35.52.21 35.21. 1	35.52.58 35.21.36	31.22	35.37.17
Sept. 2	pallido	74259 72862	36.35.50 36. 4.40	36.36.28 36. 5.17	31.11	36.20.53
Sept. 3	nebuloſo	75255 73846	36.57.48 36.26.40	36.58.27 36.27.17	31.10	36.42.52
ſept. 6	claro	78336 76877	34. 4.28 37.33. 8	38. 5. 9 37. 33.48	31.21	37.49.29
Sept. 7	claro	79391 77917	38.26.47 37.55.29	38.27.28 37.56.10	31.18	38.11.49
Sept. 8	claro	80460 78977	38.49.13 38.18. 3	38.49.56 38.18.44	31.12	38.34.20

Sept.

1703		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 9	nebuloſo	81547 80050	39.11.46 38.40.38	39.12.29 38.41.21	31. 8	38.56.55
Sept. 13	claro, cælo nubilo	86084 84504	40.43.24 40.11.56	40.44. 9 40.12.40	31.29	40.28.25
Sept. 15	ut antea	88444 86830	41.29.27 40.58. 4	41.30.13 40.58.50	31.23	41.14.32
Sept. 16	ut antea	89645 88023	41.52.29 41.21.19	41.53.17 41.22. 5	31.12	41.37.41
Sept. 17	ut antea	90875 89222	42.15.46 41.44.24	42.16.34 41.45.11	31.23	42. 0.53
Sept. 19	Sole claro	93378 91674	42. 2.20 42.30.46	43. 3. 9 42.31.34	31.35	42.47.22
Sept. 20	ut antea	94665 92940	43.25.48 42.54.16	43.26.37 42.55. 5	31.32	43.10.51
Sept. 21	ut antea	95965 94215	43.49.13 43.17.40	43.50. 4 43.18.29	31.35	43.34.17
Sept. 22	Sole claro ſpecie tremula	97271 95500	44.12.27 43.40.53	44.13.18 43.41.43	31.35	43.57.31
Sept. 23	Sole ſubpallido	98618 96835	44.36. 5 44. 4.44	44.36.57 44. 5.35	31.22	44.21.16
Sept. 25	Sole claro	101344 99494	45.22.57 44.51.17	45.23.49 44.52. 9	31.40	45. 7.59
Sept. 26	ut antea	102739 100870	45.46.26 45.14.54	45.47.20 45.15.46	31.34	45.31.33
Sept. 27	pallido	104142 102256	46. 9.44 45.38.20	46.10.38 45.39.13	31.25	45.54.56
Oct. 1	ſubpallido	110014 107988	47.43.48 47.11.58	47.44.45 47.12.54	31.51	47.28.50
Oct. 6	clariſſimo	117763 115601	49.39.48 49. 8.19	49.40.50 49. 9.19	31.31	49.25. 5

Oct.

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1703			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 11	claro	126077 123722	51.34.47 51. 3.10	51.35.53 51. 4.14	31.39	51.20. 4
Oct. 13	clariſſimo	129552 127117	52.20. 8 51.48.32	52.21.16 51.49.38	31.38	52. 5.27
Oct. 14	ut antea	131314 128831	52.42.34 52.10.52	52.43.43 52.11.59	31.44	52.27.51
Oct. 17	claro	138618 136127	54.11.35 53.41.56	54.12.47 53.43. 7	29.40	
Oct. 25	ut antea	152180 149153	56.41.26 56. 9.36	56.42.47 56.10.55	31.52	56.26.51
Oct. 27	ut antea	156236 153117	57.22.43 56.51. 6	57.24. 6 56.52.28	31.38	57. 8.17
Oct. 29	clariſſimo	160397 157138	58. 3.30 57.31.41	58. 4.56 57.33. 5	31.51	57.49. 0
Oct. 30	claro	162469 159187	58.23.15 57.51.48	58.24.43 57.53.13	31.30	58. 8.58
Oct. 31	ut antea	164575 161219	58.42.58 58.11.23	58.44.27 58.12.50	31.37	58.28.39
Nov. 3	claro	170972 167426	59.40.37 59. 9. 4	59.42.10 59.10.35	31.35	59.26.23
Nov. 5	clariſſimo, cælo ſubnubilo	175315 171620	60.17.58 59.46.17	60.19.34 59.47.50	31.44	60. 3.42
Nov. 6	ut antea	177517 173740	60.36.23 60. 4.35	60.37.59 60. 6. 9	31.50	60.22. 4
Dec. 5	Sole claro	236509 230500	67. 4.50 66.32.49	67. 6.59 66.34.55	32. 4	66.50.57
Dec. 9	ut antea	241908 235688	67.32.27 67. 0.32	67.34.38 67. 2.41	31.57	67.18.40
Dec. 10	clariſſimo	243075 236778	67.38.16 67. 6.14	67.40.30 67. 8.24	32. 6	67.24.27

Dec.

1703		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 11	ut antea	244159 237807	67.43.39 67.11.35	67.45 53 67.13.45	32. 8	67.29.49
Dec. 12	Sole languido	245129 238760	67.48.25 67.16.28	67.50.40 67.18.39	32. 1	67.34.40
Dec. 13	clariſſimo	246086 239639	67.53. 6 67.20.57	67.55.21 67.23. 8	32.13	67.39.15
Dec. 14	ut antea	246892 240408	67.57. 1 67.24.53	67.59.17 67.27. 3	32.14	67.43.10
Dec. 15	ut antea	247608 241092	68. 0.29 67.28.20	68. 2.45 67.30.32	32.13	67.46.39
Dec. 16	pallido	248245 241706	68. 3.33 67.31.36	68 5.50 67.33.39	32.11	67.49.45
Dec. 17	claro	248787 242233	68. 6. 8 67.34. 5	68. 8.25 67.36.18	32. 7	67.52.22
Dec. 21	claro	249957 243331	68.11.43 67.39.33	68.14. 0 67.41.47	32.13	67.57.54
Dec. 30	ut antea	246879 240380	67.56.57 67.24.44	67.59.13 67.26.56	32.17	67.43. 5
Dec. 31	ut antea	246067 239593	67.53. 1 67.20.44	67.55.16 67.22.55	32.21	67.39. 5
1704						
Jan. 12	cælo ſubnubilo	229954 224210	66.29.50 65.57.46	66.31.56 65.59.49	32. 7	66.15.53
Jan. 16	Sole clariſſimo	222543 217101	65.48.11 65.16. 6	65.50.13 65.18. 5	32. 8	65.34. 9
Jan. 18	ut antea	218568 213311	65.24.53 64.52.59	65.26.53 64.54.55	31.58	65.10.54
Jan. 22	Sole pallido	210243 205327	64.33.44 64. 1.58	64.35.38 64. 3.49	31.49	64.19.44

1704		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 25	Sole claro, ſpecie tremula	203750 199072	63.51.30 63.19.42	63.53.20 63.21.30	31.50	63.37.25
Jan. 26	Sole clariſſimo	201567 196943	63.36.47 63. 4.49	63.38.36 63. 6.35	32. 1	63.22.35
Jan. 30	claro	192696 188408	62.34.22 62. 2.32	62.36. 6 62. 4.14	31.52	62.20.10
Feb. 1	ut antea	188257 184082	62. 1.24 61.29.15	62. 3. 6 61.30.55	32.11	61.47. 0
Feb. 2	claro	186009 181948	61.44.14 61.12.23	61.45.56 61.14. 2	31.54	61.29.59
Feb. 12	ut antea	164125 160768	58.38.47 58. 7. 4	58.40.16 58. 8.30	31.46	58.24.23
Feb. 13	claro	162000 158726	58.18.49 57.47.18	58.20.16 57.48.43	31.33	58. 4.30
Feb. 14	claro, ſpecie tremula	159930 156654	57.59. 0 57.26.52	58. 0.26 57.28.16	32.10	57.44.21
Feb. 15	ut ſupra	157827 154624	57.38.29 57. 6.29	57.39.54 57. 7.51	32. 3	57.23.53
Feb. 16	Sole claro	155747 152599	57.17.49 56.45.46	57.19.12 56.47. 7	32. 5	57. 3.10
Feb. 18	pallidiſſimo	151645 148644	56.35.52 56. 4.10	56.37.13 56. 5.29	31.44	56.21.21
Feb. 20	claro	147651 144738	55.53.29 55.21.33	55.54.48 55.22.51	31.57	55.38.50
Feb. 21	Sole clariſſimo	145666 142822	55.31.49 55. 0. 5	55.33. 6 55. 1.20	31.46	55.17.13
Feb. 28	Sole claro	132501 129970	52.57.28 52.25.30	52.58.38 52.26.38	32. 0	52.42.38
Mar. 9	claro	115493 113365	49. 6.44 48.35. 4	49. 7.45 48.36. 3	31.42	48.51.54

Mar.

1704		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Mar. 10	clariſſimo	113917 111824	48.43.21 48.11.42	48.44.21 48.12.41	31.40	48.28.31
Mar. 15	claro, cælo nubilo	106319 104387	46.45.15 46.13.46	46.46.11 46.14.40	31.31	46.30.26
Mar. 19	claro	100618 98778	45.10.36 44.38.52	45.11.28 44.39.44	31.44	44.55.36
Mar. 21	claro	97882 96098	44.23.13 43.51.36	44.24. 4 43.52.27	31.37	44. 8.16
Mar. 26	ut antea	91379 89713	42.25.15 41.53.46	42.26. 3 41.54.34	31.29	42.10.19
Mar. 27	ut antea	90134 88489	42. 1.46 41.30.19	42. 2.33 41.31. 6	31.27	41.46.50
Mar. 30	claro, cælo nubilo	86517 84920	40.51.55 40.20.17	40.52.41 40.21. 2	31.39	40.36.51
Apr. 2	Sole claro	83045 81563	39.42.28 39.12. 6	39.43.12 39.12.49	30.23	39.28. 1
Apr. 4	Sole claro, cælo nubilo	80829 79363	38.56.54 38.26.12	38.57.37 38.26.54	30.43	38.42.16
Apr. 5	claro, cælo nubilo	79724 78271	38.33.48 38. 3. 8	38.34.30 38. 3.49	30.41	38.19.10
Apr. 6	claro, cælo nubilo	78658 77230	38.11.17 37.40.44	38.11.58 37.41.25	30.33	37.56.42
Apr. 9	ut antea	75543 74168	37. 4. 7 36.33.49	37. 4.46 36.34.27	30.19	36.49.37
Apr. 11		73539 72151	36.19.49 35.48.38	36.20.28 35.49.15	31.13	36. 4.51
Apr. 15	Sole claro, cælo nubilo	69710 68372	34.52.49 34.21.40	34.53.25 34.22.15	31.10	34.37.50
Apr. 16	Sole obnubilato	68801 67496	34.31.42 34. 1. 4	34.32.18 34. 1.39	30.39	34.16.59

1704		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 17	ut antea	67887 66604	34.10.17 33.39.54	34.10.52 33.40.29	30.23	33.55.41
Apr. 18	ut antea	67009 65730	33.49.33 33.19. 1	33.50. 8 33.19.34	30.34	33.34.51
Apr. 19	claro	66135 64850	33.28.43 32.57.48	33.29.17 32.58.21	30.56	33.13.49
Apr. 21	ut antea	64443 63161	32.47.56 32.16.37	32.48.29 32.17. 9	31.20	32.32.49
Apr. 22	claro	63619 62342	32.27.51 31.56.25	32.28.23 31.56.57	31.26	32.12.40
Apr. 23	ut antea	62803 61549	32. 7.48 31.36.42	32. 8.20 31.37.14	31. 6	31.52.47
Apr. 24	ut antea	61999 60757	31.47.55 31.16.54	31.48.27 31.17.24	31. 3	31.32.56
Apr. 25	ut antea	61211 59971	31.28.17 30.57. 6	31.28.47 30.57.36	31.11	31.13.12
Apr. 26	Sole claro	60442 59224	31. 8.59 30.38. 9	31. 9.29 30.38.39	30.50	30.54. 4
Apr. 27		59675 58467	30.49.36 30.18.49	30.50. 6 30.19.18	30.48	30.34.42
Apr. 29	Sole claro	58219 57005	30.12.28 29.41. 8	30.12.57 29.41.36	31.21	29.57.16
Maj. 2	nubilo	56029 54908	29.15.41 28.46.13	29.16. 9 28.46.41	29.28	29. 1.25
Maj. 5	claro	54106 52947	28.24.58 27.54. 0	28.25.26 27.54.27	30.59	28. 9.56
Maj. 10	Sole claro, cælo nubilo	51069 49965	27. 3.10 26.32.57	27. 3.36 26.33.22	30.14	26.48.29
Maj. 12	clariſſimo	49935 48863	26.32. 7 26. 2.30	26.32.32 26. 2.54	29.38	26.17.43

Maj.

1704		Tangentes correctæ ape numbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 17	ut antea	47382 46284	25.21. 9 24.50.12	25.21.32 24.50.35	30.57	25. 6. 3
Maj. 24	nubilo	44355 43289	23.55.12 23.24.26	23.55.34 23.24.47	30.47	23.40.10
Jun. 9	clariſſimo	39933 38892	21.46. 5 21.15. 7	21.46.25 21.15.26	30.59	21.30.55
Jun. 10	ut antea	39779 38732	21.41.32 21.10.20	21.41.52 21.10.39	31.13	21.26.15
Jun. 11	ut antea	39635 38589	21.37.16 21. 6. 4	21.37.35 21. 6.23	31.12	21.21.59
Jun. 12	Sole claro	39496 38455	21.33. 7 21. 2. 4	21.33.26 21. 2.23	31. 3	21.17.54
Jun. 15	clariſſimo	39182 38141	21.23.46 20.52.38	21.24. 5 20.52.57	31. 8	21. 8.31
Jun. 16	nebuloſo	39085 38068	21.20.53 20.50.27	21.21.12 20.50.46	30.26	21. 5.59
Jun. 18	clariſſimo	38990 37960	21.18. 4 20.47.13	21.18.23 20.47.32	30.51	21. 2.57
Jun. 19	ut antea	38950 37922	21.16.51 20.46. 4	21.17.10 20.46.23	30.47	21. 1.46
Jun. 20	claro	38934 37900	21.16.24 20.45.24	21.16.43 20.45.43	31. 0	21. 1.13
Jun. 21	clariſſimo	38928 37890	21.16.12 20.45. 5	21.16.31 20.45.24	31. 7	21. 0.57
Jun. 22	nubilo	38929 37900	21.16.14 20.45.24	21.16.33 20.45.43	30.50	21. 1. 8
Jun. 24	claro	38980 37950	21.17.45 20.46.55	21.18. 4 20.47.14	30.50	21. 2.39
Jun. 25	clariſſimo	39032 37993	21.19.18 20.48.12	21.19.37 20.48.31	31. 6	21. 4. 4

1704		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 26	ut antea	39090 38055	21.21. 2 20.50. 4	21.21.21 20.50.23	30.58	21. 5.52
Jun. 29	Sole claro, ſed dubia	39352 38328	21.28.51 20.58.15	21.29.10 20.58.34	30.36	21.13.52
Jun. 30	clariſſimo	39480 38435	21.32.39 21. 1.27	21.32.58 21. 1.46	31.12	21.17.22
Jul. 1	claro	39607 38565	21.36.25 21. 5.21	21.36.44 21. 5.40	31. 4	21.21.12
Jul. 2	Sole claro	39755 38717	21.40.49 21. 9.55	21.41. 9 21.10.14	30.55	21.25.41
Jul. 3	clariſſimo	39911 38866	21.45.26 21.14.21	21.45.46 21.14.40	31. 6	21.30.13
Jul. 4	ut antea	40088 39038	21.50.42 21.19.29	21.51. 2 21.19.48	31.14	21.35.25
Jul. 5	ut antea	40269 39221	21.56. 4 21.24.56	21.56.24 21.25.15	31. 9	21.40.49
Jul. 7	Sole claro, cælo nubilo	40678 39627	22. 8. 7 21.37. 2	22. 8.27 21.37.21	31. 6	21.52.54
Jul. 8	claro	40901 39856	22.14.42 21.43.49	22.15. 2 21.44. 9	30.53	21.59.35
Jul. 9	clariſſimo	41143 40097	22.21.49 21.50.58	22.22. 9 21.51.18	30.51	22. 6.43
Jul. 10	clariſſimo	41394 40349	22.29.12 21.58.25	22.29.32 21.58.45	30.47	22.14. 8
Jul. 11	ut antea, cælo nubilo	41664 40605	22.37. 7 22. 5.58	22.37.27 22. 6.18	31. 9	22.21.52
Jul. 12	clariſſimo	41950 40889	22.45.29 22.14.21	22.45.50 22.14.41	31. 9	22.30.15
Jul. 13		42235 41180	22.53.48 22.22.55	22.54. 9 22.23.15	30.54	22.38.42

1704		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jul. 14	claro, ſpecie tremula	42535 41480	23. 2.33 22.31.43	23. 2.54 22.32. 4	30.50	22.47.29
Jul. 16	clariſſimo	43196 42129	23.21.45 22.50.42	23.22. 6 22.51. 2	31. 4	23. 6.34
Jul. 18	ut antea	43902 42832	23.42. 9 23.11.11	23.42.31 23.11.32	30.59	23.27. 1
Jul. 21	ut antea	45062 43982	24.15.26 23.44.27	24.15.48 23.44.48	31. 0	24. 0.18
Jul. 22	ut antea	45481 44401	24.27.24 23.56.30	24.27.46 23.56.52	30.54	24.12.19
Jul. 23	ut antea	45909 44826	24.39.34 24. 8.41	24.39.57 24. 9. 3	30.54	24.24.30
Jul. 24	ut antea	46343 45260	24.51.52 24.21. 3	24.52.15 24.21.25	30.50	24.36.50
Jul. 25	ut antea	46799 45711	25. 4.45 24.33.57	25. 5. 8 24.34.20	30.48	24.49.44
Jul. 26	ut antea	47269 46173	25.19.23 24.47. 5	25.19.46 24.47.28	32.18	25. 3.36
Jul. 27	ut antea	47753 46650	25.31.33 25. 0.33	25.31.56 25. 0.56	31. 0	25.16.26
Jul. 28	ut antea	48240 47141	25.45.10 25.14.22	25.45.34 25.14.45	30.49	25.30. 9
Jul. 29	ut antea	48752 47637	25.59.25 25.28.18	25.59.49 25.28.41	31. 8	25.44.15
Jul. 30	Sole claro	49268 48154	26.13.43 25.42.45	26.14. 7 25.43. 9	30.58	25.58.38
Jul. 31	clariſſimo	49791 48685	26.28. 9 25.57.33	26.28.34 25.57.57	30.37	26.13.15
Aug. 1	ut antea	50355 49226	26.43.39 26.12.33	26.43.54 26.12.57	30.57	26.28.25

Aug.

1704		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Aug. 2	Sole clariſſimo	50914 49781	26.58.57 26.27.52	26.59.23 26.28.17	31. 6	26.43.50
Aug. 3	ut antea	51480 50343	27.14.22 26.43.19	27.14.48 26.43.44	31. 4	26.59.16
Aug. 4	ut antea	52067 50927	27.30.16 26.59.18	27.30.42 26.59.44	30.58	27.15.13
Aug. 5	ut antea	52677 51520	27.46.44 27.15.28	27.47.10 27.15.54	31.16	27.31.32
Aug. 8	Sole clariſſimo	54547 53376	28.36.39 28. 5.29	28.37. 7 28. 5.56	31.11	28.21.31
Aug. 9	ut antea	55200 54023	28.53.55 28.22. 4	28.54.23 28.22.32	31.51	28.38.27
Aug. 10	Sole clariſſimo, cælo nubilo	55873 54681	29.11.36 28.40.13	29.12. 4 28.40.41	31.23	28.56.22
Aug. 12	ut antea	57244 56050	29.47.18 29.16.14	29.47.47 29.16.42	31. 5	29.32.14
Aug. 13	clariſſimo	57950 56741	30. 5.31 29.34.16	30. 6. 0 29.34.44	31.16	29.50.22
Aug. 14	ut antea	58675 57454	30.24. 7 29.52.45	30.24.36 29.53.13	31.23	30. 8.54
Aug. 15	claro, cælo nubilo	59402 58181	30.42.40 30.11.29	30.43.10 30.11.58	31.12	30.27.34
Aug. 16	ſpecie valde tremula	60148 58922	31. 1.34 30.30.27	31. 2. 4 30.30.56	31. 8	30.46.30
Aug. 17	clariſſimo	60914 59670	31.20.50 30.49.38	31.21.20 30.50. 7	31.13	31. 5.43
Aug. 18	ut antea	61688 60439	31.40.10 31. 8.54	31.40.41 31. 9.24	31.17	31.25. 2
Aug. 19	ut antea	62476 61220	31.59.44 31.[illegible]. 3	32. 0.16 31.28.34	31.42	31.44.25

Aug.

1704		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 20	ut antea	63271 62015	32.19.19 31.48.18	32.19.51 31.48.49	31. 2	32. 4.20
Aug. 21	ut antea	64090 62817	32.39.20 32. 8. 9	32.39.52 32. 8.41	31.11	32.24.16
Aug. 25	ut antea	67492 66180	34. 0.59 33.29.47	34. 1.34 33.30.21	31.13	33.45.57
Aug. 26	ut antea	68388 67059	34.22. 3 33.50.43	34.22.38 33.51.18	31.20	34. 6.58
Aug. 27	ut antea	69291 67945	34.43. 7 34.11.39	34.43.42 34.12.14	31.28	34.27.58
Aug. 28	claro	70210 68859	35. 4.22 34.33. 3	35. 4.57 34.33.38	31.19	34.49.17
Aug. 29	nubilo	71143 69777	35.25.45 34.54.22	35.26.21 34.54.57	31.24	35.10.39
Aug. 30	nebuloſo	72087 70716	35.47.12 35.15.59	35.47.48 35.16.34	31.14	35.32.11
Aug. 31	clariſſimo	73052 71660	36. 8.56 35.37.31	36. 9.33 35.38. 7	31.26	35.53.50
Sept. 1	ut antea	74027 72622	36.30.41 35.59.16	36.31.19 35.59.53	31.26	36.15.36
Sept. 3	ut antea	76027 74602	37.14.40 36.43.25	37.15.19 36.44. 3	31.16	36.59.41
Sept. 4	Sole clariſſimo	77053 75613	37.36.32 37. 5.39	37.37.12 37. 6.18	30.54	37.21.45
Sept. 6	nebuloſo	79128 77672	38.21.14 37.50.14	38.21.56 37.50.55	31. 1	38. 6.25
Sept. 7	claro	80203 78719	38.43.50 38.12.34	38.44.32 38.13.15	31.17	38.28.53
Sept. 8	clariſſimo	81291 79788	39. 6.29 38.35. 9	39. 7.12 38.35.51	31.21	38.51.31

1704		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 9	ut antea	82383 80885	38.28.58 38.58. 4	39.29.41 38.58.47	30.54	39.14.14
Sept. 11	ut antea	84632 83097	40.14.31 39.43.32	40.15.15 39.44.15	31. 0	39.59.45
Sept. 12	Sole claro, cælo nubilo	85797 84230	40.37.43 40. 6.26	40.38.28 40. 7.10	31.18	40.22.49
Sept. 13	Sole claro	86961 85383	41. 0.38 40.29.54	41. 1.24 40.30.39	30.45	40.46. 1
Sept. 14	pallido	88055 86539	41.21.55 40.52.21	41.22.42 40.53. 7	29.35	41. 7.54
Sept. 18	clariſſimo	93053 91377	42.56.21 42.25.12	42.57.10 42.26. 0	31.10	42.41.35
Sept. 19	claro	94334 92633	43.19.48 42.48.36	43.20.38 42.49.25	31.13	43. 5. 1
Sept. 20	pallido	95633 93903	43.43.16 43.11.57	43.44. 6 43.12.46	31.20	43.28.26
Sept. 21	claro	96950 95193	44. 6.46 43.36.21	44. 7.37 43.37.11	30.26	43.52.24
Sept. 22	clariſſimo	98276 96481	44.30. 6 43.58.26	44.30.57 43.59.17	31.40	44.15. 7
Sept. 24	ut antea	100966 99158	45.16.32 44.45.28	45.17.24 44.46.19	31. 5	45. 1.51
Sept. 25	claro	102379 100538	45.40.24 45. 9.13	45.41.17 45.10. 5	31.12	45.25.41
Sept. 26	pallido	103815 101916	46. 4.21 45.32.37	46. 5.15 45.33.30	31.45	45.49.22
Sept. 27	clariſſimo	105217 103320	46.27.23 45.56. 8	46.28.18 45.57. 2	31.16	46.12.40
Sept. 28	pallido	106655 104746	46.50.40 46.19.40	46.51.36 46.20.35	31. 1	46.36. 5

Sept.

1704		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 30	claro	109634 107633	47.37.52 47. 6.19	47.38.49 47. 7.15	31.34	47.23. 2
Oct. 8		122287 120016	50.43.32 50.11.53	50.44.36 50.12.56	31.40	50.28.46
Oct. 9		123950 121659	51. 6.15 50.34.51	51. 7.19 50.35.55	31.24	50.51.37
Oct. 10	clariſſimo	125639 123327	51.28.58 50.57.47	51.30. 3 50.58.51	31.12	51.14.27
Oct. 11	ut antea	127365 124997	51.51.47 51.20.22	51.52.53 51.21.27	31.26	51.37.10
Oct. 23	Sole claro, cælo nubilo	149682 146724	56.15.13 55.43.25	56.16.33 55.44.43	31.50	56. 0.38
Oct. 25	ut antea	153680 150624	56.56.52 56.25.11	56.58.14 56.26.31	31.43	56.42.22
Oct. 27	Sole clariſſimo	157776 154625	57.37.59 57. 6.30	57.39.23 57. 7.52	31.31	57.23.37
Oct. 31	ut antea	166130 162768	58.57.17 58.26. 5	58.58.47 58.27.33	31.14	58.43.10
Nov. 23	Sole claro	216139 211029	65.10.18 64.38.43	65.12.16 64.40.38	31.38	64.56.27
Nov. 24	Sole maxime languido	218132 212975	65.22.17 64.50.53	65.24.16 64.52.49	31.27	65. 8.32
Dec. 10	Sole claro	244024 237568	67.42.59 67.10. 4	67.45.13 67.12.14	32.59	67.28.43
Dec. 27	Sole claro	248329 241805	68. 3.57 67.31.56	68. 6.13 67.34. 9	32. 4	67.50.11
1705						
Jan. 7	Sole pallido	226843 230805	67. 6.34 66.34.28	67. 8.44 67.36.34	32.10	66.52.39

1705		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 17	claro	152126 149114	56.40.54 56. 9.11	56.42.15 56.10.30	31.45	56.26.22
Feb. 19	ut antea	148115 145207	55.58.29 55.26.45	55.59.48 55.28. 2	31.46	55.43.55
Feb. 20	clariſſimo	146148 143281	55.37. 7 55. 5.16	55.38.24 55. 6.31	31.53	55.22.27
Feb. 21	ut antea	144171 141413	55.15.15 54.44. 3	55.16.31 54.45.17	31.14	55. 0.54
Feb. 22	ut antea	142271 139520	54.53.49 54.22. 9	54.55. 4 54.23.22	31.42	54.39.13
Feb. 23	ut antea	140376 137657	54.32. 6 54. 0.14	54.33.20 54. 1.26	31.54	54.17.23
Feb. 28	clariſſimo	131110 128631	52.40. 0 52. 8. 2	52.41. 9 52. 9. 9	32. 0	52.25. 9
Mar. 1	ut antea	129332 126882	52.17.19 51.45.26	52.18.27 51.46.32	31.55	52. 2.29
Mar. 2	ut antea	127574 125185	51.54.31 51.22.54	51.55.38 51.23.59	31.39	51.39.48
Mar. 3	ut antea	125823 123473	51.31.25 50.59.46	51.32.31 51. 0.50	31.41	51.16.40
Mar. 4	pallido	124087 121818	51. 8. 6 50.37. 3	51. 9.11 50.38. 7	31. 4	50.53.39
Mar. 7	claro	119095 116894	49.58.51 49.27.14	49.59.54 49.28.15	31.39	49.44. 4
Mar. 17	claro	103759 101888	46. 3.25 45.32. 9	46. 4.19 45.33. 2	31.17	45.48.41
Apr. 5	clariſſimo	79982 78479	38.39.12 38. 7.28	38.39.54 38. 8. 9	31.45	38.24. 2
Apr. 9	clariſſimo	75790 74358	37. 9.31 36.38. 1	37.10.10 36.38.39	31.31	36.54.24

1705		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 15	ut antea	69950 68605	34.58.22 34.27. 7	34.58.57 34.27.42	31.15	34.43.19
Apr. 16	ut antea	69024 67688	34.36.54 34. 5.38	34.37.29 34. 6.13	31.16	34.21.51
Apr. 17	ut antea	68118 66798	34.15.43 33.44.31	34.16.18 33.45. 5	31.13	34. 0.41
Apr. 21	Sole clariſſimo	64647 63361	32.52.53 32.21.31	32.53.26 32.22. 3	31.23	32.37.44
Apr. 22	ut antea	63807 62548	32.32.26 32. 1.31	32.32.58 32. 2. 3	30.55	32.17.30
Apr. 24	pallido	62184 60940	31.52.30 31.21.29	31.53. 2 31.22. 0	31. 2	31.37.31
Apr. 27	ut antea	59853 58639	30.54. 5 30.23.12	30.54.35 30.23.41	30.54	30.39. 8
Apr. 29	ut antea	58376 57177	30.16.29 29.45.35	30.16.58 29.46. 3	30.55	30. 1.30
Apr. 30	Sole claro	57647 56475	29.57.45 29.27.21	29.58.14 29.27.49	30.25	29.43. 1
Maj. 1	clariſſimo	56950 55754	29.39.42 29. 8.28	29.40.11 29. 8.56	31.15	29.24.33
Maj. 3	Sole claro, cælo nubilo	55568 54402	29. 3.37 28.32.49	29. 4. 5 28.33.17	30.48	28.48.41
Maj. 10	clariſſimo	51226 50069	27. 7.28 26.35.48	27. 7.54 26.36.14	31.40	26.52. 4
Maj. 11	pallido	50621 49522	26.50.57 26.20.44	26.51.23 26.21. 9	30.14	26.36.16
Maj. 14	claro	48997 47909	26. 6.13 25.35.57	26. 6.37 25.36.21	30.16	25.51.29
Maj. 15	claro	48500 47391	25.52.24 25.21.24	25.52.48 25.21.47	31. 1	25.37.17

1705		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 16	ut antea	47989 46885	25.38. 9 25. 7.10	25.38.33 25. 7.33	31. 0	25.23. 3
Maj. 18	nebuloſo	46950 45932	25. 9. 0 24.40.13	25. 9.23 24.40.36	28.47	
Maj. 19	clariſſimo	46561 45473	24.58. 2 24.27.10	24.58.25 24.27.32	30.53	24.42.58
Maj. 22		45256 44182	24.20.59 23.50.12	24.21.21 23.50.34	30.47	24. 5.57
Maj. 24		44441 43386	23.57.39 23.27.14	23.58. 1 23.27.35	30.26	23.42.48
Maj. 29	clariſſimo	42671 41617	23. 6.30 22.35.44	23. 6.51 22.36. 4	30.47	22.51.27
Maj. 30	claro	42354 41309	22.57.16 22.26.42	22.57.37 22.27. 2	30.35	22.42.19
Maj. 31	Sole valde nebuloſo	42057 41010	22.48.37 22.17.55	22.48.58 22.18.15	30.43	22.33.36
Jun. 2	Sole claro	41500 40458	22.32.20 22. 1.39	22.32.40 22. 1.59	30.41	22.17.19
Jun. 7	clariſſimo	40341 39300	21.58.11 21.27.18	21.58.31 21.27.37	30.54	21.43. 4
Jun. 9	pallido	39956 38932	21.46.47 21.16.19	21.47. 7 21.16.38	30.29	21.31.52
Jun. 17	claro	39057 38014	21.20. 4 20.48.49	21.20.23 20.49. 8	31.15	21. 4.45
Jun. 22	fulgidiſſimo	38928 37896	21.16.12 20.45.16	21.16.31 20.45.35	30.56	21. 1. 3
Jun. 24	claro	38953 37942	21.16.56 20.46.40	21.17.15 20.46.59	30.16	21. 2. 7
Jun. 25	Sole claro	39013 37983	21.18.44 20.47.55	21.19. 3 20.48.14	30.49	21. 3.38

Jun.

1705		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 26	clariſſimo	39077 38040	21.20.40 20.49.36	21.20.59 20.49.55	31. 4	21. 5.27
Jun. 27	ut antea	39144 38118	21.22.40 20.51.56	21.22.59 20.52.15	30.44	21. 7.37
Jun. 28	ut antea	39233 38193	21.25.18 20.54.12	21.25.37 20.54.31	31. 6	21.10. 4
Jun. 29	ut antea	39331 38292	21.28.13 20.57.11	21.28.32 21.57.30	31. 2	21.13. 1
Jul. 2		39710 38668	21.39.29 21. 8.25	21.39.49 21. 8.44	31. 5	21.24.16
Jul. 3		40035 38996	21.49. 7 21.18.14	21.49.27 21.18.33	30.54	21.34. 0
Jul. 6		40410 39367	22. 0.13 21.29.18	22. 0.33 21.29.37	30.56	21.45. 5
Jul. 10		41322 40283	22.27. 5 21.56.28	22.27.25 21.56.47	30.38	22.12. 6
Jul. 11		41589 40537	22.34.55 22. 3.58	22.35.15 22. 4.17	30.58	22.19.46
Jul. 13		42150 41109	22.51.19 22.20.49	22.51.40 22.21. 9	30.31	22.36.24
Jul. 14	Majorem tangentem in meis adverſariis perperam conſignatam ſic reſtitui ex libello ſupputationum, quas me curante, dietim ſubducebat Antonius Roſellius Picenus, dum vixit, Aſtronomiæ ſtudioſus	42444 41406	22.59.55 22.29.34	23. 0.16 22.29.54	30.22	22.45. 5
Jul. 15		42774 41717	23. 9.30 22.38.41	23. 9.51 22.39. 1	30.50	22.54.26

Jul.

1705		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jul. 16		43113 42046	23.19.21 22.48.18	23.19.42 22.48.39	31. 3	23. 4.10
Jul. 17		43450 42391	23.29.50 22.58.21	23.30.11 22.58.42	31.29	23.14.26
Jul. 19	Sole clariſſimo	44182 43111	23.50.12 23.19.17	23.50.34 23.19.38	30.56	23.35. 6
Jul. 20	ut antea	44559 43501	24. 1. 2 23.30.35	24. 1.24 23.30.56	30.28	23.46.10
Jul. 22	ut antea	45366 44286	24.24. 7 23.53.12	24.24.29 23.53.34	30.55	24. 9. 1
Jul. 24	ut antea	46231 45142	24.48.42 24.17.43	24.49. 5 24.18. 5	31. 0	24.33.35
Jul. 25	ut antea	46690 45594	25. 1.41 24.30.36	25. 2. 4 24.30.58	31. 6	24.46.31
Jul. 26	ut antea	47150 46054	25.14.38 24.43.41	25.15. 1 24.44. 3	30.58	24.59.32
Jul. 27	pallido	47615 46531	25.27.42 24.57.10	25.28. 5 24.57.33	30.32	25.12.49
Jul. 30	clariſſimo	49133 48020	26. 9.59 25.39. 2	26.10.23 25.39.25	30.58	25.54.54
Jul. 31	ut antea	49671 48553	26.24.50 25.53.53	26.25.15 25.54.17	30.58	26. 9.46
Aug. 2	ut antea	50771 49640	26.55. 3 26.24. 0	26.55.29 26.24.25	31. 4	26.39.57
Aug. 3	ut antea	51338 50196	27.10.31 26.39.18	27.10.57 26.39.43	31.14	26.55.20
Aug. 4	Sole clariſſimo	51924 50779	27.26.24 26.55.16	27.26.50 26.55.42	31. 8	27.11.16
Aug. 5	ut antea	52512 51370	27.42.12 27.11.23	27.42.39 27.11.49	30.50	27.27.14

1705		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Aug. 6	pallido	53128 51978	27.58.51 27.27.49	27.59.18 27.28.15	31. 3	27.43.46
Aug. 7	clariſſimo	53744 52578	28.15.19 27.44. 5	28.15.46 27.44.31	31.15	28. 0. 8
Aug. 8	ut antea	54380 53222	28.32.14 28. 1.22	28.32.42 28. 1.49	30.53	28.17.15
Aug. 12	clariſſimo	57065 55876	29.42.40 29.11.41	29.43. 8 29.12. 9	30.59	29.27.38
Aug. 13	ut antea	57763 56565	30. 0.43 29.29.41	30. 1.12 29.30. 9	31. 3	29.45.40
Aug. 14	ut antea	58489 57277	30.19.23 29.48. 9	30.19.52 29.48.37	31.15	30. 4.14
Aug. 15	ut antea	59213 58003	30.37.52 30. 6.54	30.38.21 30. 7.22	30.59	30.22.51
Aug. 16	ut antea	59965 58732	30.56.57 30.25.35	30.57.27 30.26. 4	31.23	30.41.45
Aug. 17	ut antea	60722 59490	31.16. 1 30.44.54	31.16.31 30.45.23	31. 8	31. 0.57
Aug. 18	ut antea	61488 60249	31.35.12 31. 4. 6	31.35.43 31. 4.36	31. 7	31.20. 9
Aug. 19	ut antea	62267 61033	31.54.33 31.23.49	31.55. 5 31.24.20	30.45	31.39.42
Aug. 20	ut antea	63078 61830	32.14.34 31.43.42	32.15. 6 31.44.13	30.53	31.59.39
Aug. 21	ut antea	63882 62632	32.34.16 32. 3.35	32.34.48 32. 4. 7	30.41	32.19.27
Aug. 22	ut antea	64707 63444	32.54.20 32.23.34	32.54.53 32.24. 6	30.47	32.39.29
Aug. 25	ut antea	67277 65974	35.55.53 33.24.51	33.56.28 33.25.25	31. 3	33.40.56

Aug.

1705		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 27	ut antea	69072 67737	34.38. 1 34. 6.45	34.38.36 34. 7.20	31.16	34.22.58
Aug. 28	ut antea	69988 68639	34.59.15 34.27.55	34.59.50 34.28.30	31.20	34.44.10
Aug. 29	ut antea	70909 69559	35.20.25 34.49.20	35.21. 1 34.49.55	31. 6	35. 5.28
Aug. 31	ut antea	72815 71431	36. 3.37 35.32.19	36. 4.14 35.32.55	31.19	35.48.34
Sept. 3	ut antea	75782 74360	37. 9.20 36.38. 4	37. 9.59 36.38.42	31.17	36.54.20
Sept. 4	ut antea	76785 75365	37.31. 8 37. 0.13	37.31.48 37. 0.52	30.56	37.16.20
Sept. 6	Sole pallido	78862 77415	38.15.36 37.44.43	38.16.17 37.45.23	30.54	38. 0.50
Sept. 9	claro	82108 80608	39.23.20 38.52.17	39.24. 3 38.52.59	31. 4	39. 8.31
Sept. 10	clariſſimo	83225 81696	39.46. 8 39.14.51	39.46.51 39.15.34	31.17	39.31.12
Sept. 13	Sole clariſſimo	86659 85097	40.54.42 40.23.48	40.55.28 40.24.33	30.55	40.40. 0
Sept. 18	ut antea	92751 91079	42.50.47 42.19.37	42.51.36 42.20.25	31.11	42.36. 0
Sept. 21	ut antea	96620 94874	44. 0.55 43.29.36	44. 1.46 43.30.26	31.20	43.46. 6
Sept. 24	ut antea	100653 98842	45.11.11 44.39.59	45.12. 3 44.40.50	31.13	44.56.26
Sept. 25	ut antea	102051 100203	45.34.54 45. 3.30	45.35.47 45. 4.22	31.25	45.20. 4
Sept. 26	ut antea	103438 101586	45.58. 5 45.27. 3	45.58.59 45.27.56	31. 3	45.43.27

Sept.

1705		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 28	ut antea	106310 104400	46.45. 7 46.13.59	46.46. 2 46.14.53	31. 9	46.30.27
Oct. 1	ut antea	110791 108763	47.55.50 47.24.13	47.56.48 47.25.10	31.38	47.40.59
Oct. 2	ut antea	112286 110269	48.18.44 47.47.45	48.19.43 47.48.43	31. 0	48. 4.13
Oct. 3	ut antea	113825 111772	48.41.57 48.10.54	48.42.56 48.11.52	31. 4	48.27.24
Oct. 4	pallido	115401 113212	49. 5.23 48.32.45	49. 6.23 48.33.44	32.39	48.50. 3
Oct. 20	nubilo	143360 140605	55. 6. 9 54.34.45	55. 7.24 54.35.59	31.25	54.51.41
Oct. 28	clariſſimo	159388 156166	57.53.45 57.22. 2	57.55.11 57.23.26	31.45	57.39.18
Oct. 29	claro	161483 158216	58.13.54 57.42.19	58.15.21 57.43.44	31.37	57.59.32
Nov. 4	claro	174262 170610	60. 9. 3 59.37.27	60.10.38 59.38.59	31.39	59.54.48
Nov. 10	clariſſimo	187465 183389	61.55.23 61.23.49	61.57. 5 61.25.29	31.36	61.41.17
Nov. 21	claro	211554 206598	64.42. 1 64.10.16	64.43.56 64.12. 8	31.48	64.28. 2
Nov. 22	ut antea	213610 208596	64.54.49 64.23.14	64.56.45 64.25. 7	31.38	64.40.56
Dec. 10	claro	243616 237349	67.40.58 67. 9.12	67.43.12 67.11.22	31.50	67.27.17
Dec. 17	claro	248970 242496	68. 7. 1 67.35.23	68. 9.18 67.37.36	31.42	67.53.27
Dec. 19	pallido	249665 243376	68.10.28 67.39.46	68.12.45 67.41.59	30.46	67.57.22

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1705			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 20	claro	249923 243308	68.11.33 67.39.26	68.13.50 67.41.39	32.11	67.57.44
Dec. 23	ſublanguido	249909 243270	68.11.29 67.39.20	68.13.46 67.41.33	32.13	67.57.39
Dec. 25	clariſſimo	249422 242808	68. 9.10 67.36.57	68.11.27 67.39.10	32.17	67.55.18
1706						
Jan. 23	Sole pallido	206993 202168	64.12.52 63.40.52	64.14.44 63.42.41	32. 3	63.58.42
Jan. 24	pallido	204785 200104	63.58.23 63.26.42	64. 0.14 63.28.30	31.44	63.44.22
Jan. 25	ut antea	202634 198004	63.44. 1 63.12.16	63.45.51 63.14. 3	31.48	63.29.57
Jan. 27	claro	198259 193690	63.14. 3 62.41.40	63.15.50 62.43.25	32.25	62.59.37
Jan. 29	claro	193761 189463	62.42. 6 62.10.28	62.43.51 62.12.11	31.40	62.28. 1
Jan. 30	claro	191549 187305	62.25.58 61.54.10	62.27.42 61.55.52	31.50	62.11.47
Jan. 31	ut antea	189304 185222	62. 9.17 61.38. 8	62.11. 0 61.39.49	31.11	61.55.24
Feb. 9	ut antea	169446 165909	59.27.10 58.55.15	59.28.42 58.56.45	31.57	59.12.43
Feb. 10	clariſſimo	167300 163832	59. 7.55 58.36. 3	59. 9.22 58.37.28	31.54	58.53.25
Feb. 17	claro	152630 149599	56.46. 5 56.14.21	56.47.26 56.15.41	31.45	56.31.33
Feb. 26	pallido	135176 132639	53.30.25 52.59.11	53.31.36 53. 0.21	31.15	53.15.58

1706		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 27		133359 130824	53. 8. 7 52.36.22	53. 9.17 52.37.31	31.46	52.53.24
Mar. 17		104096 102213	46. 8.59 45.37.37	46. 9.53 45.38.30	31.23	45.54.11
Mar. 18		102691 100822	45.45.38 45.14. 4	45.46.31 45.14.56	31.35	45.30.43
Mar. 19		101280 99426	45.21.52 44.50. 6	45.22.45 44.50.58	31.47	45. 6.51
Mar. 21	claro	98529 96726	44.34.32 44. 2.47	44.35.23 44. 3.38	31.45	44.19.30
Mar. 22	claro	97171 95426	44.10.41 43.39.33	44.11.32 43.40.23	31. 9	43.55.57
Mar. 23	ut antea	95836 94109	43.46.55 43.15.51	43.47.45 43.16.40	31. 5	43.32.12
Mar. 26	clariſſimo	91975 90306	42.36.23 42. 5. 2	42.37.11 42. 5.49	31.22	42.21.30
Apr. 2	claro	83592 82038	39.53.34 39.21.53	39.54.18 39.22.36	31.42	39.38.27
Apr. 8	ut antea	77069 75640	37.37.16 37. 6.14	37.37.56 37. 6.53	31. 3	37.22.24
Apr. 10	ut antea	75004 73606	36.52.17 36.21.19	36.52.56 36.21.57	30.59	36.37.26
Apr. 13	ut antea	72061 70691	35 46.37 35.15.25	35.47.13 35.16. 0	31.13	35.31.36
Apr. 16	ut antea	69238 67901	34.41.53 34.10.37	34.42.28 34.11.12	31.16	34.26.50
Apr. 24	clariſſimo	62382 61129	31.57.24 31.26.12	31.57.56 31.26.43	31.13	31.42.19
Apr. 25	claro	61579 60349	31.37.27 31. 6.37	31.37.58 31. 7. 7	30.51	31.22.32

1706		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 27	Sole claro	60047 58821	30.59. 0 30.27.58	30.59.30 30.28.27	31. 3	30.43.58
Maj. 6	Sole clariſſimo	53777 52620	28.16.13 27.45.11	28.16.41 27.45.38	31. 3	28. 1. 9
Maj. 10	ut antea	51340 50214	27.10.34 26.39.47	27.11. 0 26.40.12	30.48	26.55.36
Maj. 12	Poſt magnam Solis eclipſim. Cælo ſubnubilo	50196 49107	26.39.18 26. 9.15	26.39.43 26. 9.39	30. 4	26.24.41
Maj. 13	clariſſimo	49665 48545	26.24.41 25.53.40	26.25. 6 25.54. 4	31. 2	26. 9.35
Maj. 15		48616 47512	25.55.55 25.24.47	25.56.19 25.25.10	31. 9	25.40.44
Maj. 16	pallido	48102 47090	25.41.37 25.12.57	25.42. 1 25.13.20	28.41	25.27.41
Maj. 23	clariſſimo	44933 43869	24.11.45 23.41.12	24.12. 7 23.41.33	30.34	23.56.50
Maj. 24	pallido	44496 43476	23.59.14 23.29.51	23.59.36 23.30.12	29.24	23.44.54
Maj. 27	clariſſimo	43417 42373	23.28. 9 22.57.49	23.28.30 22.58.10	30.20	23.13.20
Maj. 31	claro	42123 41088	22.50.32 22.20.12	22.50.53 22.20.32	30.21	22.35.42
Jun. 1		41845 40789	22.42.23 22.11.23	22.42.44 22.11.43	31. 1	22.27.13
Jul. 2	clariſſimo. Deinceps ad diem 25 Julii 1708 ut plurimum obſervabat Gabriel, interdum & Heraclitus Manfredii fratres	39665 38647	21.38. 9 21. 7.48	21.38.29 21. 8. 7	30.22	21.23.18
Jul. 19	clariſſimo	44081 43031	23.47.18 23.16.58	23.47.40 23.17.19	30.21	23.32.29

1706		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jul. 25	ut antea	46574 45491	24.58.24 24.27.41	24.58.47 24.28. 3	30.44	24.43.25
Jul. 26	ut antea	47022 45951	25.11. 2 24.40.45	25.11.25 24.41. 8	30.17	24.56.16
Jul. 28	ut antea	47994 46899	25.38.17 25. 7.34	25.38.41 25. 7.57	30.44	25.23.19
Aug. 22		64510 63238	32.49.34 32.18.31	32.50. 7 32.19. 3	31. 4	32.34.35
Aug. 23	Sole pallido	65338 64073	33. 9.35 32.38.56	33.10. 8 32.39.28	30.40	32.54.48
Aug. 29	pallido	70678 69302	35.15. 7 34.43.22	35.15.42 34.43.57	31.45	34.59.49
Aug. 31	clariſſimo	72571 71197	35.58. 8 35.26.59	35.58.45 35.27.35	31.10	35.43.10
Sept. 1	claro	73546 72159	36.19.59 35.48.50	36.20.37 35.49.27	31.10	36. 5. 2
Sept. 4	pallido	76534 75122	37.25.42 36.54.52	37.26.22 36.55.31	30.51	37.10.56
Sept. 5	clariſſimo	77573 76131	37.48. 7 37.16.56	37.48.47 37.17.35	31.12	37.33.11
Sept. 6	ut antea	78619 77168	38.10.27 37.39.24	38.11. 8 37.40. 4	31. 4	37.55.36
Sept. 10	claro	82955 81447	39.40.39 39. 9.42	39.41.22 39.10.25	30.57	39.25.53
Sept. 13	Sole clariſſimo	86394 84816	40.49.31 40.18.12	40.50.16 40.18.56	31.20	40.34.36
Sept. 14	ut antea	87562 85972	41.12.22 40.41.11	41.13. 8 40.41.56	31.12	40.57.32
Sept. 15	pallidiſſimo	88743 87153	41.35.13 41. 4.24	41.36. 0 41. 5.10	30.50	41.20.35

Sept.

1706		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 20	clariſſimo	95004 93287	43.31.57 43. 0.40	43.32.47 43. 1.29	31.18	43.17. 8
Sept. 21	pallidiſſimo	96297 94568	43.55.10 43.24. 3	43.56. 1 43.24.53	31. 8	43.40.27
Sept. 25	claro	101720 99860	45.29.18 44.57.35	45.30.11 44.58.27	31.44	45.14.19
Oct. 8	Sole pallidiſſimo	121459 119245	50.32. 4 50. 0.59	50.33. 8 50. 2. 2	31. 6	50.17.35
Oct. 11	clariſſimo	126540 124188	51.40.55 51. 9.29	51.42. 1 51.10.33	31.28	51.26.17
Oct. 12	ut antea	128288 125883	52. 3.49 51.32.13	52. 4.56 51.33.19	31.37	51.49. 7
Oct. 17	ut antea	137269 134657	53.55.36 53.24. 7	53.56.48 53.25.17	31.31	53.41. 2
Oct. 31	ut antea	165150 161806	58.48.17 58.16.59	58.49.46 58.18.26	31.20	58.34. 6
Nov. 14	Sole claro	195838 191648	62.57. 0 62.26.41	62.58.46 62.28.25	30.21	62.43.35
Nov. 17	claro	202446 197816	63.42.45 63.10.57	63.44.35 63.12.44	31.51	63.28.39
Nov. 24	pallido	217277 212070	65.17.10 64.45.15	65.19. 9 64.47.10	31.59	65. 3. 9
Dec. 2	clariſſimo	232222 226407	66.42. 8 66.10.11	66.44.15 66.12.15	32. 0	66.28.15
Dec. 3	pallidiſſimo	233858 227920	66.50.52 66.18.38	66.53. 0 66.20.43	32.17	66.36.51
Dec. 5	clariſſimo	236963 230919	67. 7.12 66.35. 6	67. 9.22 66.37.12	32.10	66.53.17
Dec. 6	ut antea	238359 232307	67.14.40 66.42.35	67.16.51 66.44.42	32. 9	67. 0.46

Dec.

1706		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 7	ut antea	239742 233608	67.21.30 66.49.33	67.23.41 66.51.41	32. 0	67. 7.41
Dec. 8	claro	241055 234844	67.28. 9 66.56. 6	67.30.21 66.58.15	32. 6	67.14.18
Dec. 15	pallido	247864 241269	68. 1.43 67.29.14	68. 3.59 67.31.27	32.32	67.47.43
Dec. 19	clariſſimo	249686 243083	68.10.25 67.38.19	68.12.42 67.40.32	32.10	67.56.37
Dec. 20	clariſſimo	249934 243285	68.11.36 67.39.19	68.13.53 67.41.33	32.20	67.57.43
Dec. 29	pallido	247[illegible]26 241066	68. 0.33 67.28.12	68. 2.49 67.30.24	32.25	67.46.36
Dec. 30	pallidiſſimo	246710 240168	67.56. 8 67.23.40	67.58.24 67.25.52	32.32	67.42. 8
Dec. 31	clariſſimo	245854 239405	67.51.58 67.19.47	67.54.13 67.21.58	32.15	67.38. 5
1707						
Jan. 6	Sole claro	238970 232837	67.17.33 66.45.26	67.19.44 66.47.33	32.11	67. 3.38
Jan. 19	pallido	215976 210847	65. 9.18 64.37.34	65.11.16 64.39.29	31.47	64.55.22
Jan. 29	pallido	194360 189956	62.46.25 62.14. 9	62.48.10 62.15.52	32.18	62.32. 1
Feb. 4	clariſſimo	180980 177061	61. 4.38 60.32.35	61. 6.16 60.34.11	32. 5	60.50.14
Feb. 8	ut antea	172114 168526	59.50.35 59.18.57	59.52. 8 59.20.28	31.40	59.36.18
Feb. 9	pallido	169977 166436	59.31.52 59. 0. 4	59.33.24 59. 1.34	31.50	59.17.29

Feb.

1707		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Feb. 19	clariſſimo	149085 146141	56. 8.52 55.37. 3	56.10.11 55.38.20	31.51	55.54.15
Feb. 21	claro	145129 142319	55.25.53 54.54.22	55.27.10 54.55.37	31.33	55.11.24
Feb. 24	claro	139409 136718	54.20.52 53.49. 1	54.22. 5 53.50.12	31.53	54. 6. 8
Feb. 25	clariſſimo	137519 134879	53.58.35 53.26.48	53.59.47 53.27.58	31.49	53.43.52
Feb. 26	ut antea	135662 133062	53.36.18 53. 4.27	53.37.29 53. 5.37	31.52	53.21.33
Feb. 28	ut antea	132009 129493	52.51.19 52.19.38	52.52.29 52.20.48	31.41	52.36.38
Mar. 12	ut antea	111923 109880	48.13.17 47.41.42	48 14.15 47.42.39	31.36	47.58.27
Mar. 13	ut antea	110413 108382	47.50. 0 47.18.12	47.50.57 47.19. 9	31.48	47.35. 3
Mar. 24	pallido	94856 93139	43.29.16 42.57.56	43.30. 6 42.58.45	31.21	43.14.25
Mar. 26	ut antea	92279 90620	42.42. 2 42.10.59	42.42.50 42.11.46	31. 4	42.27.18
Mar. 27	clariſſimo	91034 89383	42.18.46 41.47.29	42.19.34 41.48.16	31.18	42. 3.55
Mar. 29	ut antea	88579 86958	41.32. 3 41. 0.34	41.32.50 41. 1.20	31.30	41.17. 5
Mar. 30	ut antea	87376 85776	41. 8.45 40.37.18	41. 9.31 40.38. 3	31.28	40.53.47
Apr. 4	claro	81611 80109	39.13. 6 38.41.52	39.13.49 38.42.34	31.15	38.58.12
Apr. 16	clariſſimo. Nocte ſeq. tangentes Lunæ in meridiana incorrectæ 143198, 140546	69458 68128	34.46.59 34.15.57	34.47.34 34.16.32	31. 2	34.32. 3

Apr.

1707		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 17	pallidiſſimo	68531 67231	34.25.24 33.54.49	34.25.59 33.55.24	30.35	34.10.41
Apr. 24	Sole clariſſimo	62571 61322	32. 2. 4 31.31. 3	32. 2.36 31.31.34	31. 2	31.47. 5
Apr. 25	ut antea	61778 60534	31.42.25 31.11.18	31.42.56 31.11.48	31. 8	31.27.22
Apr. 27	ut antea	60229 58998	31. 3.36 30.32.23	31. 4. 6 30.32.52	31.14	30.48.29
Maj. 15	Sole pallido	48740 47628	25.59. 5 25.28. 4	25.59.29 25.28.28	31. 1	25.43.58
Maj. 22	Sole clariſſimo	45453 44373	24.26.36 23.55.43	24.26.58 23.56. 5	30.53	23.11.31
Maj. 24	pallidiſſimo	44622 43567	24. 2.52 23.32.29	24. 3.14 23.32.50	30.24	23.48. 2
Jun. 3	clariſſimo	41357 40309	22.28. 7 21.57.14	22.28.27 21.57.34	30.53	22.13. 0
Jun. 9	ut antea	40056 39016	21.49.45 21.18.51	21.50. 5 21.19.10	30.55	21.34.37
Jun. 10	ut antea	39890 38852	21.44.51 21.13.56	21.45.11 21.14.15	30.56	21.29.43
Jun. 13	ut antea	39464 38414	21.32.12 21. 0.50	21.32.32 21. 1. 9	31.23	21.16.50
Jun. 14	ut antea	39348 38306	21.28.34 20.57.36	21.28.53 20.57.55	30.58	21.13.24
Jun. 19	pallido	38978 37942	21.17.42 20.46.40	21.18. 1 20.46.59	31. 2	21. 2.30
Jun. 22	claro	38924 37880	21.16. 6 20.44.49	21.16.25 20.45. 8	31.17	21. 0.46
Jun. 25	clariſſimo	38991 37959	21.18. 6 20.47.11	21.18.25 20.47.30	30.55	21. 2.57

1707		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 26	ut antea	39048 38008	21.19.46 20.45.40	21.20. 5 20.45.59	34. 6	
Jun. 29	ut antea	39275 38249	21.26.33 20.55.54	21.26.52 20.56.13	30.39	21.11.33
Jun. 30	ut antea	39387 38353	21.29.53 20.59. 0	21.30.12 20.59.19	30.53	21.14.45
Jul. 2	ut antea	39642 38608	21.37.28 21. 6.38	21.37.48 21. 6.57	30.51	21.22.22
Jul. 3	ut antea	39783 38745	21.41.40 21.10.46	21.42. 0 21.11. 5	30.55	21.26.32
Jul. 4	claro	39950 38914	21.46.37 21.15.48	21.46.57 21.16. 7	30.50	21.31.32
Jul. 7	clariſſimo	40521 39480	22. 3.30 21.32.40	22. 3.50 21.33. 0	30.50	21.48.25
Jul. 9	ut antea	40956 39922	22.16.20 21.45.46	22.16.40 21.46. 6	30.34	22. 1.23
Jul. 10	ut antea	41206 40157	22.23.41 21.52.45	22.24. 1 21.53. 5	30.56	22. 8.33
Jul. 12	ut antea	41733 40683	22.39. 9 22. 8.18	22.39.30 22. 8.38	30.52	22.24. 4
Jul. 16	ut antea	42950 41886	23.14.36 22.43.37	23.14.57 22.43.58	30.59	22.59.27
Jul. 22	ut antea	45175 44097	24.18.41 23.47.46	24.19. 3 23.48. 7	30.56	24. 3.35
Jul. 25	ut antea	46472 45369	24.55.30 24.24.12	24.55.53 24.24.34	31.19	24.40.18
Jul. 27	ut antea	47390 46293	25.21.23 24.50.28	25.21.46 24.50.51	30.55	25. 6.18
Jul. 28	claro	47873 46785	25.34.55 25. 4.22	25.35.19 25. 4.45	30.34	25.20. 2

1707		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jul. 29	clariſſimo	48374 47274	25.48.55 25.18. 7	25.49.19 25.18.30	30.49	25.33.54
Aug. 4	Sole clariſſimo	51634 50505	27.18.33 26.47.47	27.18.59 26.48. 3	30.56	27. 3.31
Aug. 9	ut antea	54720 53563	28.41.16 28.10.30	28.41.44 28.10.57	30.47	28.26.21
Aug. 14	ut antea	58141 56933	30.10.28 29.39.16	30.10.57 29.39.45	31.12	29.55.21
Aug. 24	ut antea	65997 64697	33.25.26 32.54. 7	33.26. 1 32.54.40	31.21	33.10.20
Aug. 27	pallido	6[illegible]626 67314	34.27.38 33.56.47	34.28.13 33.57. 2	31.11	34.12.37
Sept. 7	clariſſimo	79428 77956	38.27.34 37.56.19	38.28.16 37.57. 0	31.16	38.12.38
Sept. 8	ut antea	80500 79013	38.50. 2 38.18.49	38.50.45 38.19.30	31.15	38.35. 7
Sept. 9	ut antea	81591 80089	39.12.41 38.41.28	39.13.24 38.42.11	31.13	38.57.47
Sept. 18	ut antea	92148 90476	42.39.37 42. 8.16	42.40.25 42. 9. 3	31.22	42.24.44
Sept. 19	ut antea	93414 91715	43. 3. 0 42.31.32	43. 3.49 42.32.20	31.29	42.48. 4
Sept. 22	ut antea	97314 95552	44.13.13 43.41.52	44.14. 4 43.42.42	31.22	43.58.23
Sept. 23	ut antea	9[illegible]659 96867	44.36.49 44. 5.18	44.37.41 44. 6. 9	31.32	44.21.55
Sept. 26	ut antea	102784 100921	45.47.12 45.15.46	45.48. 5 45.16.38	31.27	45.32.21
Sept. 29	pallidiſſimo	107104 105149	46.57.53 46.26.17	46.58.49 46.27. 2	31.47	46.42.55

1707		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 6	ut antea	117813 115679	49.40.32 49. 9.29	49.41.33 49.10.29	31. 4	49.26. 1
Oct. 11	clariſſimo	126147 123794	51.35.43 51. 4. 8	51.36.49 51. 5.12	31.37	51.21. 0
Nov. 5	clariſſimo	175391 171689	60.18.37 59.46.53	60.20.12 59.48.26	31.46	60. 4.21
Nov. 6	ut antea	177593 173795	60.37. 0 60. 5. 3	60.38.36 60. 6.37	31.59	60.22.36
Nov. 12		190843 186616	62.20.45 61.48.54	62.22.27 61.50.34	31.53	62. 6.29
Dec. 2	Sole claro	231786 225116	66.39.47 66. 2.55	66.41.54 66. 4.58	36.56	
Dec. 7	clariſſimo	239427 233289	67.19.53 66.47.51	67.22. 4 66.49.58	32. 6	67. 6. 1
Dec. 11	ut antea	244194 237860	67.43.49 67.11.51	67.46. 3 67.14. 1	32. 2	67.30. 2
Dec. 21	ut antea	249988 243383	68.11.52 67.39.49	68.14. 7 67.42. 2	32. 5	67.58. 4
1708						
Jan. 13	Sole pallido	228109 222462	66.19.40 65.47.43	66.21.45 65.49.45	32. 0	66. 5.45
Jan. 18	claro	218540 213295	65.24.43 64.52.52	65.26.36 64.54.48	31.48	65.10.42
Jan. 23	Sole claro	208097 203208	64.20. 1 63.47.52	64.21.54 63.49.41	32.13	64. 5.47
Jan. 31	clariſſimo	190437 186187	62.17.45 61.45.36	62.19.28 61.47.18	32.10	62. 3.23
Feb. 10	ut antea	168345 164843	59.17.20 58.45.27	59.18.51 58.46.56	31.55	59. 2.53

Feb.

1708		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Feb. 11	claro	166182 162783	58.57.45 58.26.13	58.59.15 58.27.41	31.34	58.43.28
Feb. 23	pallido	141754 139050	54.47.57 54.16.36	54.49.11 54.17.49	31.22	54.33.30
Feb. 24	claro	139764 137245	54.25. 0 53.55.19	54.26.13 53.56.31	29.42	54.11.22
Feb. 25	clariſſimo	137959 135330	54. 3.44 53.32.17	54. 4.56 53.33.28	31.28	53.49.12
Mar. 14	Sole claro	107740 105786	47. 8. 0 46.36.38	47. 8.56 46.37.33	31.23	46.53.14
Mar. 16	ut antea	104821 102907	46.20.55 45.49.15	46.21.40 45.50. 9	31.31	46.21.54
Mar. 17	clariſſimo	103490 101500	45.58.57 45.25.36	45.59.41 45.27.29	32.12	45.43.35
Mar. 23	ut antea	95175 93442	43.35. 2 43. 3.30	43.35.52 43. 4.19	31.33	43.20. 5
Maj. 22	Sole claro	45135 44127	24.17.31 23.48.38	24.17.53 23.49. 0	28.33	24. 3.26
Jul. 25	clariſſimo. Per hoc tempus obſervationes habebat Antonius Leprottus poſtmodum Archiater Pontificius	46813 45705	25. 5. 9 24.33.46	25. 5.32 24.34. 9	31.23	24.49.50
Jul. 26	claro	47255 46173	25.17.35 24.47. 3	25.17.58 24.47.26	30.2	25. 2.42
Jul. 27	clariſſimo	47764 46651	25.31.51 25. 0.34	25.32.15 25. 0.57	31.18	25.16.36
Jul. 28	ut antea	48262 47151	25.45.47 25.14.39	25.46.11 25.15. 2	31. 9	25.30.36
Jul. 29	clariſſimo	48779 47638	26. 0.10 25.28.20	26. 0.34 25.28.43	31.51	25.44.38

Jul.

1708		Tangen- tes corre ctę a pe numbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera lim borum	Diam. app. Solis	Diſt. a vertice vera cen- tri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 30	ut antea	49276 48166	26.13.57 25.43. 5	26.14.21 25.43.29	30.52	25.58.55
Jul. 31	ut antea	49837 48700	26.29.25 25.57.58	26.29.50 25.58.23	31.27	26.14. 6
Aug. 1	ut antea	50360 49237	26.43.46 26.12.51	26.44.11 26.13.15	30.56	26 28.43
Aug. 2	ut antea	50924 49787	26.59.12 26.28. 1	26.59.38 26.28.26	31.12	26.44. 2
Aug. 3	nebuloſo	51499 50363	27.14.53 26.43.53	27.15.19 26.44.18	31. 1	26.59.48
Aug. 5	Sole claro, cælo nubilo	52680 51536	27.46.50 27.15.53	27.47.17 27.16.19	30.58	27.31.48
Aug. 7	clariſſimo	53859 52756	28.18.24 27.48.51	28.18.52 27.49.18	29.34	28. 4. 5
Aug. 8	ut antea	54555 53392	28.36.53 28. 5.55	28.37.20 28. 6.22	30.58	28.21.51
Aug. 10	ut antea	55880 54700	29.11.47 28.40.43	29.12.15 28.41.11	31. 4	28.56.43
Aug. 11	Sole clariſſimo	56553 55375	29.29.22 28.58.33	29.29.50 28.59. 0	30.50	29.14.25
Aug. 12	ut antea	57267 56070	29.47.55 29.16.45	29.48.23 29.17.13	31.10	29.32.48
Aug. 16	ut antea	60162 58938	31. 1.55 30.30.51	31. 2.25 30.31.20	31. 5	30.46.52
Aug. 17	ut antea	60928 59689	31.21.12 30.49.57	31.21.42 30.50.26	31.16	31. 6. 4
Aug. 18	nubilo	61706 60484	31.40.37 31.10. 2	31.41. 8 31.10.32	30.36	31.25.50
Aug. 19	clariſſimo	62516 61273	32. 0.43 31.29.49	32. 1.15 31.30.20	30.55	31.45.47

Aug.

1708		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Aug. 20	ut antea	63298 62025	32.20. 0 31.48.33	32.20.32 31.49. 4	31.28	32. 4.48
Aug. 21	ut antea	64116 62837	32.40. 0 32. 8.38	32.40.33 32. 9.10	31.23	32.24.51
Aug. 22	ut antea	64935 63655	32.59.51 32.28.43	33. 0.24 32.29.15	31. 9	32.44.49
Aug. 23	ut antea	65783 64489	33.20.17 32.49. 3	33.20.51 32.49.36	31.15	33. 5.13
Aug. 26	ut antea	68413 67079	34.22.37 33.51.11	34.23.12 33.51.46	31.26	34. 7.29
Aug. 27	ut antea	69315 67967	34.43.39 34.12. 9	34.44.14 34.12.44	31.30	34.28.29
Aug. 30	claro, cælo nubilo	72122 70732	35.48. 0 35.16.21	35.48.37 35.16.57	31.40	35.32.47
Aug. 31	clariſſimo	73081 71691	36. 9.34 35.38.13	36.10.11 35.38.49	31.22	35.54.30
Sept. 2	ut antea	75062 73630	36.53.33 36.21.51	36.54.12 36.22.29	31.43	36.38.20
Sept. 3	ut antea	76065 74624	37.15.30 36.43.54	37.16.10 36.44.32	31.38	37. 0.21
Sept. 6	ut antea	79163 77685	38.21.58 37.50.30	38.22.40 37.51.11	31.29	38. 6.55
Sept. 7	ut antea	80230 78750	38.44.24 38.13.13	38.45. 6 38.13.55	31.11	38.29.30
Sept. 8	ut antea	81326 79812	39. 7.12 38.35.38	39. 7.55 38.36.20	31.35	38.52. 7
Sept. 10	ut antea	84680 83132	40.15.28 39.44.14	40.16.13 39.44.58	31.15	40. 0.35
Sept. 15	Sole claro, cælo nubilo	89393 87758	41.47.40 41.16.10	41.48.27 41.16.57	31.30	41.32.42

Sept.

1708		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 16	nubilo	90588 88965	42.10.22 41.39.28	42.11.10 41.40.15	30.55	41.55.42
Sept. 17	Sole claro, cælo nubilo	91854 90178	42.34. 7 42. 2.36	42.34.55 42. 3.23	31.32	42.19. 9
Sept. 22	ut antea	98322 96545	44.30.54 43.59.34	44.31.46 44. 0.25	31.21	44.16. 5
Sept. 23	ut antea	99672 97881	44.54.21 44.23.11	44.55.13 44.24. 2	31.11	44.39.37
Sept. 28	clariſſimo	106729 104766	46.51.51 46.20. 0	46.52.47 46.20.55	31.52	46.36.51
Sept. 30		109655 107696	47.38.12 47. 7.19	47.39. 6 47. 8.12	30.54	47.23.39
Oct. 10		125711 123377	51.29.55 50.58.27	51 31. 1 50.59.31	31.30	51.15.16
Oct. 14		132725 130220	53. 0.15 52.28.41	53. 1.25 52.29.49	31.36	52.45.37
Oct. 16		136372 133768	53.44.52 53.13.10	53.46. 3 53.14.20	31.43	53.30.11
Oct. 18		140102 137403	54.28.55 53.57.12	54.30. 8 53.58.24	31.44	54.14.16
Oct. 20		143833 141137	55.11.27 54.40.52	55.12.43 54.42. 6	30.37	54.57.24
Nov. 1		168364 164905	59.17.30 58.46. 1	59.19. 1 58.47.30	31.31	59. 3.15
Nov. 2		170503 166964	59.36.30 59. 4.52	59.38. 2 59. 6.22	31.40	59.22.12
1709						
Mar. 28	nubilo. Ego	89166 87516	41.43.19 41.11.28	41.44. 5 41.12.14	31.51	41.28. 9

1709		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ' ''	Diſt. a vertice vera limborum G ' ''	Diam. app. Solis ' ''	Diſt. a vertice vera centri G ' ''
Mar. 30	clariſſimo Sole	86738 85167	40.56.16 40.25.13	40.57. 2 40.25.58	31. 4	40.41.30
Apr. 1	ut antea	84427 82834	40.10.24 39.38.11	40.11. 8 39.38.55	32.13	39.55. 1
Apr. 5	nubilo	79881 78456	38.37. 5 38. 6.59	38.37.47 38. 7.40	30. 7	38.22.43
Apr. 6	clariſſimo	78875 77401	38.15.53 37.44.25	38.16.34 37.45. 5	31.29	38. 0.49
Apr. 12	ſpecie languida	72754 71380	36. 2.15 35.31. 9	36. 2.52 35.31.45	31. 7	35.47.18
Maj. 2	Sole clariſſimo	56222 55040	29.22. 3 28.49.42	29.22.31 28.50. 9	32.22	29. 6.20
Maj. 3	nubilo	55546 54350	29. 3. 1 28.31.27	29. 3.29 28.31.55	31.34	28.47.42
Maj. 5	ut antea	54235 53075	28.28.24 27.57.26	28.28.51 27.57.53	30.58	28.13.22
Maj. 6	ut antea	53578 52430	28.10.54 27.40. 6	28.11.21 27.40.33	30.48	27.55.57
Maj. 9	Sole languido	51771 50623	27.22.19 26.51. 0	27.22.45 26.51.25	31.20	27. 7. 5
Maj. 10	claro	51193 50036	27. 6.34 26.34.55	27. 7. 0 26.35.20	31.40	26.51.10
Maj. 11	ut antea	50622 49465	26.50.50 26.19.10	26.51.15 26.19.34	31.41	26.35.24
Maj. 14	ut antea	48998 47853	26. 6.15 25.34.22	26. 6.39 25.34.45	31.54	25.50.42
Maj. 19	Sole claro	46541 45431	24.57.29 24.25.58	24.57.52 24.26.20	31.32	24.42. 6
Maj. 21	Sole languido	45656 44556	24.32.23 24. 0.58	24.32.46 24. 1.20	31.26	24.17. 3

Maj.

1709		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum G ' ''	Diſt. a vertice vera limborum G ' ''	Diam. app. Solis ' ''	Diſt. a vertice vera centri G ' ''
Maj. 22	ut antea	45212 44121	24.19.45 23.48.28	24.20. 7 23.48.50	31.17	24. 4.28
Maj. 25	Sole languido	44052 42965	23.46.29 23.15. 4	23.46.51 23.15.25	31.26	23 31. 8
Maj. 26	Sole claro	43687 42598	23.35.58 23. 4.24	23.36.20 23. 4.46	31.34	23.20.33
Maj. 29	ut antea	42666 41581	23. 6.22 22.34.42	23. 6.43 22.35. 2	31.41	22.50.52
Jun. 5	ut antea	40753 39698	22.10.21 21.39. 9	22.10.41 21.39.29	31.12	21.55. 5
Jul. 9	Sole languido	39968 38911	21.47. 9 21.15.42	21.47.29 21.16. 2	31.27	21.31.45
Jun. 10	ut antea	39817 38750	21.42.41 21.10.55	21.43. 1 21.11.15	31.46	21.27. 8
Jun. 13	ut antea	39398 38344	21.30.13 20.58.44	21.30.33 20.59. 3	31.30	21.14.48
Jun. 14	claro	39292 38233	21.27. 4 20.55.15	21.27.24 20.55.34	31.50	21.11.29
Jun. 15	languido	39196 38145	21.24.12 20.52.47	21.24.32 20.53. 6	31.26	21. 8.49
Jun. 16	valde nubilo	39103 38071	21.21.16 20.50.32	21.21.36 20.50.51	30.45	21. 6.13
Jun. 18	languido	38998 37946	21.18.18 20.46.48	21.18.37 20.47. 7	31.30	21. 2.52
Jun. 24	nubilo	38966 37913	21.17.21 20.45.49	21.17.40 20.46. 8	31.32	21. 1.54
Jun. 28	ut antea	39240 38180	21.25.31 20.53.49	21.25.51 20.54. 8	31.43	21. 9.59
Jun. 29	claro	39333 38287	21.28.18 20.57. 2	21.28.38 20.57.21	31.17	21.12.59

Jun.

1709		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 30	claro	39449 38391	21.31.44 21. 0. 9	21.32. 4 21. 0.28	31.36	21.16.16
Jul. 1	ut antea	39575 38534	21.35.29 21. 4.26	21.35.49 21. 4.45	31. 4	21.20.17
Jul. 2	ut antea	39724 38668	21.39.55 21. 8.26	21.40.15 21. 8.45	31.30	21.24.30
Jul. 3	ut antea	39874 38823	21.44.22 21.13. 5	21.44.42 21.13.24	31.18	21.29. 3
Jul. 6	ut antea	40421 39361	22. 0.34 21.29. 7	22. 0.54 21.29.27	31.27	21.45.10
Jul. 7	ut antea	40629 39576	22. 6.42 21.35.31	22. 7. 2 21.35.51	31.11	21.51.26
Jul. 13	Sole languido	42162 41093	22.51.41 22.20.23	22.52. 2 22.20.43	31.19	22.36.22
Jul. 14	Sole claro	42469 41396	23. 0.40 22.29.16	23. 1. 1 22.29.36	31.25	22.45.18
Jul. 15	ut antea	42797 41722	23.10.11 22.38.49	23.10.32 22.39. 9	31.23	22.54.50
Jul. 16	ut antea	43134 42053	23.19.58 22.48.30	23.20.19 22.48.51	31.28	23. 4.35
Jul. 18	Sole languido	43829 42745	23.40. 3 23. 8.21	23.40.25 23. 8.42	31.43	23.24.33
Jul. 21	languido	44972 43887	24.12.53 23.41.44	24.13.15 23.42. 6	31. 9	23.57.40
Jul. 22	Sole claro	45398 44298	24.25. 2 23.53.33	24.25.24 23.53.55	31.29	24. 9.39
Jul. 23	ut antea	45818 44716	24.37. 0 24. 5.33	24.37.23 24. 5.55	31.28	24.21.39
Jul. 25	ut antea	46701 45600	25. 2. 0 24.30.48	25. 2.23 24.31.10	31.13	24.46.46

1709		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jul. 27	clariſſimo	47636 46527	25.28.17 24.57. 5	25.28.40 24.57.28	31.12	25.13. 4
Jul. 28	ut antea	48141 47028	25.42.25 25.11.13	25.42.49 25.11.36	31.13	25.27.12
Jul. 29	ut antea	48635 47510	25.55.52 25.24.45	25.56.16 25.25. 8	31. 8	25.40.42
Aug. 1	ut antea	50227 49095	26.40.10 26. 8.57	26.40.35 26. 9.21	31.14	26.24.58
Aug. 2	claro	50782 49650	26.55.21 26.24.17	26.55.47 26.24.42	31. 5	26.40.14
Aug. 3	clariſſimo	51353 50212	27.10.55 26.39.45	27.11.21 26.40.11	31.10	26.55.46
Aug. 4	ut antea	51936 50791	27.26.15 26.55.36	27.26.41 26.56. 1	30.40	27.11.21
Aug. 8	ut antea	54408 53234	28.33. 0 28. 1.42	28.33.28 28. 2. 9	31.19	28.17.48
Aug. 9	ut antea	55057 53872	28.50. 9 28.18.45	28.50.37 28.19.12	31.25	28.34.54
Aug. 10	ut antea	55718 54536	29. 7.33 28.36.24	29. 8. 1 28.36.52	31. 9	28.52.26
Aug. 11	ut antea	56399 55207	29.25.22 28.54. 8	29.25.50 28.54.36	31.14	29.10.12
Aug. 12	ut antea	57091 55889	29.43.22 29.12. 2	29.43.51 29.12.30	31.21	29.28.10
Aug. 13	ut antea	57795 56583	30. 1. 4 29.30. 9	30. 1.33 29.30.37	30.56	29.46. 5
Aug. 14	claro	58519 57293	30.20. 9 29.48.35	30.20.38 29.49. 4	31.34	30. 4.51
Aug. 15	clariſſimo	59235 58015	30.38.26 30. 7.14	30.38.56 30. 7.43	31.13	30.23.19

Aug.

1709		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Aug. 16	ut antea	59984 58750	30.57.26 30.26. 4	30.57.5' 30.26.34	31.22	30.42.15
Aug. 20	ut antea	63104 61842	32.15.13 31.44. 1	32.15.45 31.44 32	31.13	32. 0. 8
Nov. 19	Sole clariſſimo	207344 202466	64.15. 9 63.42.53	64.17. 2 63.44.40	32.22	64. 0.51
Nov. 20	ut antea	209471 204555	64.28.50 63.56.51	64.30.44 64.58.41	32. 3	64.14.42
Nov. 21	Sole claro	211611 206607	64.42.22 64.10.21	64.44.17 64.12.13	32. 4	64.28.15
Nov. 24	clariſſimo	217791 212568	65.20.15 64.48.22	65.22.14 64.50.17	31.57	65. 6.15
Dec. 1	Sole languido	230971 225192	66.35.22 66. 3.20	66.37.28 66. 5.23	32. 5	66.21.25
Dec. 6	clariſſimo	238751 232597	67.16.26 66.44. 9	67.18.37 66.46.16	32.21	67. 2.26
Dec. 7	Sole clariſſimo	240089 233897	67.23.16 66.51. 5	67.25.28 66.53.13	32.15	67. 9.20
Dec. 11	Sole claro	244728 238345	67.46.27 67.14.21	67.48.41 67.16.31	32.10	67.32.36
Dec. 12	Sole languido	245657 239226	67.51. 1 67.18.52	67.53.15 67.21. 3	32.12	67.37. 9
Dec. 19	clariſſimo	249750 243096	68.10.30 67.38.23	68.12.47 67.40.36	32.11	67.56.41
Dec. 26	languido	248972 242390	68. 7. 1 67.34.51	68. 9.17 67.37. 4	32.13	67.53.10
Dec. 27	Sole claro	248486 241913	68. 4.42 67.32.28	68. 6.58 67.34.41	32.17	67.50.49
Dec. 29	clariſſimo	247188 240698	67.58.27 67.26.21	68. 0.43 67.28.33	32.10	67.44.38

		Tangentes correctæ apenumbra	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
1709			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 30	claro	246453 239954	67.54.54 67.22.35	67.57. 9 67.24.47	32.22	67.40.58
Dec. 31	ut antea	245566 239077	67.50.34 67.18. 6	67.52.49 67.20.17	32.22	67.36.33
1710						
*Jan.*1	Sole clariſſimo. Hoc anno, & deinceps ad annum 1714 obſervationes a me rogatus habebat Jul. Cæſar Pariſius cum ſociis	244590 238197	67.45.47 67.13.35	67.48. 2 67.15.46	32.16	67.31.54
*Jan.*2	ut antea	243541 237193	67.40.36 67. 8.24	67.42.50 67.10.34	32.16	67.26.42
*Jan.*3	claro	242399 236140	67.34.54 67. 2.54	67.37. 7 67. 5. 3	32. 4	67.21. 5
*Jan.*4	ut antea	241200 235032	67.28.53 66.57. 5	67.31. 5 66.59.14	31.51	67.15. 9
*Jan.*6	languido	238550 232429	67.15.24 66.43.15	67.17.35 66.45.22	32.13	67. 1.28
*Jan.*7	ut antea	237113 231070	67. 7.59 66.35.55	67.10. 9 66.38. 1	32. 8	66.54. 5
*Jan.*12	clariſſimo	228962 223242	66.24.24 65.52.13	66.26.29 65.54.15	32.14	66.10.22
*Jan.*15	ut antea	223417 217903	65.53.13 65.20.55	65.55.15 65.22.54	32.21	65.39. 4
*Jan.*23	ut antea	206935 202085	64.12.49 63.40.19	64.14.41 63.42. 8	32.33	63.58.24
*Jan.*26	ut antea	200367 195741	63.28.37 62.56.19	63.30.25 62.58. 5	32.20	63.14.15
*Jan.*29	claro	193707 189360	62.41.43 62. 9.42	62.43.28 62.11.25	32. 3	62.27.26

Jan.

1710		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jan. 30	clariſſimo	191459 187184	62.25.18 61.53.15	62.26. 2 61.53.57	32. 5	62. 9.59
Feb. 1	ut antea	187016 182872	61.51.57 61.19.44	61.53.38 61.21.24	32.14	61.37.31
Feb. 5	ut antea	178127 174273	60.41.24 60. 9. 8	60.43. 1 66.10.43	32.18	60.26.52
Feb. 7	ut antea	173708 169998	60. 4.19 59.32. 3	60. 5.53 59.33.35	32.18	59.49.44
Feb. 8	ut antea	171518 167911	59.45.24 59.13.26	59.46.57 59.14.57	32. 0	59.30.57
Mar. 9	Sole languido	116204 114034	49.17.11 48.45. 5	49.18.12 48.46. 5	32. 7	49. 2. 8
Mar. 10	Sole claro	114613 112498	48.53.43 48.21.58	48.54.43 48.22.57	31.46	48.38.50
Mar. 11	ut antea	113046 110960	48.30.15 47 58.27	48.31.14 47.59.25	31.49	48.15.19
Mar. 13	Sole languido	109983 107953	47.43.19 47.11.25	47.44.17 47.12.22	31.55	47.28.19
Mar. 15	claro	106974 105007	46.55.47 46.23.57	46.56.43 46.24.52	31.51	46.40.47
Mar. 16	ut antea	105519 103564	46.32.18 46. 0.11	46.33.13 46. 1. 5	32. 8	46.17. 9
Mar. 17	ut antea	104067 102162	46. 8.30 45.36.46	46. 9.24 45.37.39	31.45	45.53.31
Mar. 19	Sole clariſſimo	101239 99372	45.21.10 44.49.10	45.22. 3 44.50. 2	32. 1	45. 6. 2
Mar. 20	ut antea	99842 98032	44.57.17 44.25.50	44.58. 9 44.26.41	31.28	44.42.25
Mar. 21	☼ ut antea. Suſpecta	98534 96676	44.34.37 44. 1.54	44.35.29 44. 2.45	32.44	44.19. 7

Mar.

1710		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Mar. 22	ut antea	97141 95337	44.10. 9 43.37.58	44.11. 0 43.38.48	32.12	43.54.54
Mar. 23	ut antea	95818 94042	43.46.36 43.14.29	43.47.27 43.15.19	32. 8	43.31.23
Mar. 24	ut antea	94499 92739	43.22.48 42.50.53	43.23.37 42.51.22	32.15	43. 7.29
Mar. 26	Sole languido	91938 90250	42.35.42 42. 3.59	42.36.30 42. 4.46	31.44	42.20.38
Mar. 27	Sole clariſſimo	90686 89009	42.12.13 41.40.19	42.13. 0 41.41. 6	31.54	41.57. 3
Mar. 28	Sole languido	89451 87796	41.48.47 41.16.55	41.49.34 41.17.41	31.53	41.33.37
Mar. 29	ut antea	88230 86619	41.25.19 40.53.56	41.26. 6 40.54.42	31.24	41.10.24
Mar. 31	ut antea	85858 84255	40.38.56 40. 6.57	40.39.41 40. 7.41	32. 0	40.23.41
Apr. 1	ut antea	84690 83121	40.15.41 39.44. 2	40.16.25 39.44.46	31.39	40. 0.35
Apr. 4	Sole clariſſimo	81306 79794	39. 6.47 38.35.16	39. 7.31 38.35.59	31.32	38.51.45
Apr. 8	Sole claro	77026 75570	37.36.21 37. 4.43	37.37. 1 37. 5.22	31.39	37.21.11
Apr. 10	ut antea	74977 73550	36.51.41 36.20. 5	36.52.20 36.20.43	31.37	36.36.31
Apr. 11	Sole claro, cælo nubilo	73986 72553	36.28.46 35.57.43	36.29.24 35.58.20	31. 4	36.13.52
Apr. 12	Sole claro	72996 71591	36. 7.41 33.35.58	36. 8.18 35.36.34	31.44	35.52.26
Apr. 13	ut antea	72026 70633	35.45.50 35.14. 5	35.46.27 35.14.41	31.46	35.30.34

Apr.

1710		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 14	ut antea	71078 69693	35.24.16 34.52.26	35.24.52 34.53. 1	31.51	35. 8.56
Apr. 17	Sole claro	68299 66959	34.19.58 33.48.21	34.20.33 33.48.55	31.38	34. 4.44
Apr. 18	Sole claro, cælo nubilo	67406 66078	33.58.57 33.27.22	33.59.32 33.27.56	31.36	33.43.44
Apr. 20	Sole claro	65665 64356	33.17.28 32.45.50	33.18. 1 32.46.22	31.39	33. 2.11
Apr. 21	Sole languido	64817 63508	32.57. 1 32.25. 9	32.57.34 32.25.41	31.53	32.41.37
Apr. 22	ut antea	63974 62695	32.36.32 32. 5. 9	32.37. 5 32. 5.41	31.24	32.21.23
Apr. 24	languido	62347 61090	31.56.33 31.25.15	31.57. 5 31.25.46	31.19	31.41.25
Maj. 4	Sole claro	55042 53859	28.49.46 28.18.24	28.50.14 28.18.52	31.22	28.34.33
Maj. 7	languido	53132 51938	27.58.58 27.26.48	27.59.25 27.27.15	32.10	27.43.20
Maj. 8	clariſſimo	52520 51354	27.42.31 27.10.57	27.42.58 27.11.23	31.35	27.27.10
Maj. 9	ut antea	51912 50760	27.26. 6 26.54.45	27.26.32 26.55.11	31.21	27.10.51
Maj. 10	clariſſimo	51338 50173	27.10.31 26.38.40	27.10.57 26.39. 5	31.52	26.55. 1
Maj. 11	ut antea	50758 49619	26.54.42 26.23.25	26.55. 8 26.23.50	31.18	26.39.29
Maj. 12	ut antea	50196 49064	26.39.18 26. 8. 5	26.39.43 26. 8.29	31.14	26.24. 6
Maj. 13	ut antea	49652 48518	26.24.20 25.52.55	26.24.45 25.53.19	31.26	26. 9. 2

1710		*Tangentes correctę a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Maj. 14	ut antea	49117 47992	26. 9.33 25.38.15	26. 9.57 25.38.39	31.18	25.54.18
Maj. 16	ut antea	48093 46983	25.41. 5 25. 9.57	25.41.29 25.10.20	31. 9	25.25.54
Maj. 17	languido	47603 46490	25.27.22 24.56. 1	25.27.45 24.56.24	31.21	25.12. 4
Maj. 21	languido	457[illegible]1 44[illegible]60	24.35.39 24. 3.21	24.36. 2 24. 3 43	32.19	24.19.52
Maj. 24	claro	44523 43448	24. 0. 2 2[illegible].29. 3	24. 0.24 23.29.24	31. 0	23.44.54
Maj. 30	clariſſimo	42428 41364	22.59.26 22.28.19	22.59.47 22.28.39	31. 8	22.44.13
Maj. 31	ut antea	42126 41058	22.50.39 22.19.21	22.51. 0 22.19.41	31.19	22.35.20
Jun. 3	Sole claro, cælo nubilo	41298 40235	22.26.23 21.55. 4	22.26.43 21.55.23	31.20	22.11. 3
Jun. 5	ut antea	40816 39757	22.12.12 21.40.53	22.12.32 21.41.12	31.20	21.56.52
Jun. 15	ut antea	39229 38177	21.25.11 20.53.44	21.25.30 20.54. 3	31.27	21. 9.46
Jun. 17	ut antea	39061 38023	21.20.11 20.49. 7	21.20.30 20.49.26	31. 4	21. 4.58
Jun. 19	clariſſimo	38970 37921	21.17.28 20.46. 3	21.17.47 20.46.22	31.25	21. 2. 4
Jun. 20	Sole clariſſimo	38938 37896	21.16.31 20.45.18	21.16.50 20.45.37	31.13	21. 1.13
Jun. 22	claro	38914 37875	21.15.47 20.44.40	21.16. 6 20.44.59	31. 7	21. 0.32
Jun. 24	clariſſimo	38968 37919	21.17.25 20.46. 0	21.17.44 20.46.19	31.25	21. 2. 1

Jun.

1710		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jul. 13	ut antea	42097 41036	22.49.47 22.18.42	22.50. 6 22.19. 0	31. 6	22.34.33
Jul. 17	ut antea	43380 42310	23.27. 5 22.56. 0	23.27.26 22.56.21	31. 5	23.11.53
Jul. 20	ut antea	44477 43400	23.58.40 23.27.39	23.59. 2 23.28. 0	31. 2	23.43.31
Jul. 21	ut antea	44876 43793	24.10. 8 23.39. 2	24.10.30 23.39.23	31. 7	23.54.56
Jul. 22	languido	45283 44200	24.21.46 23.50.45	24.22. 9 23.51. 7	31. 2	24. 6.38
Jul. 23	claro	45709 44611	24.33.53 24. 2.32	24.34.16 24. 2.54	31.22	24.18.35
Jul. 24	clariſſimo	46143 45044	24.46.13 24.14.57	24.46.36 24.15.19	31.17	24.30.57
Jul. 26	ut antea	47056 45948	25.12. 0 24.40.41	25.12.23 24.41. 4	31.19	24 56.43
Jul. 27	ut antea	47529 46411	25.25.17 24.53.48	25.25.40 24.54.11	31.29	25. 9.55
Jul. 28	ut antea	48019 46909	25.39. 0 25. 7.52	25.39.24 25. 8.15	31. 9	25.23.49
Jul. 30	ut antea	49035 47910	26. 7.17 25.35.58	26. 7.41 25.36.22	31.19	25.52. 1
Jul. 31	nubilo	49554 48432	26.21.38 25.50.31	26.22. 3 25.50.55	31. 8	26. 6.29
Aug. 4	ut antea	51792 50662	27.22.50 26.52. 5	27.23.16 26.52.30	30.46	27. 7.53
Aug. 15	clariſſimo	59065 57838	30.33.52 30. 2.40	30.34.22 30. 3. 9	31.13	30.18.45
Aug. 16	ut antea	59[illegible]03 58572	30.52.51 30.21.31	30.53.21 30.22. 0	31.21	30.37.40

		Tangentes correctæ apenumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1710			G ′ ″	G ′ ″	′ ″	G ′ ″
Nov. 19	Sole languido	206838 202005	64.11.52 63.39.46	64.13.44 63.41.35	32. 9	63.57.39
Nov. 20	ut antea	208977 204074	64.25.40 63.53.39	64.27.34 63.55.30	32. 4	64.11.32
Nov. 21	clariſſimo	211114 206144	64.39.15 64. 7.19	64.41.10 64. 9.11	31.59	64.25.10
Nov. 23	ut antea	215407 210153	65. 5.51 64.33.10	65. 7.49 64.35. 4	32.45	64.51.26
Nov. 28	claro	225160 219601	66. 3. 6 65.31. 1	66. 5. 9 65.33. 1	32. 8	65.49. 5
Nov. 29	ut antea	226997 221362	66.13.29 65.41.21	66.15.33 65.43.22	32.11	65.59.27
Nov. 30	ut antea	228794 223084	66.23.28 65.51.18	66.25.33 65.53.20	32.13	66. 9.26
Dec. 4	Sole languido	235466 229428	66.59.23 66.26.57	67. 1.32 66.29. 3	32.29	66.45.17
1711						
Feb. 20	Sole claro	146995 144093	55.46.22 55.14.22	55.47.40 55.15.38	32. 2	55.31.39
Feb. 22	clariſſimo	143108 140339	55. 3.19 54.31.40	55. 4.36 54.32.56	31.42	54.48.45
Feb. 23	languido	141196 138458	54.41.33 54. 9.42	54.42.47 54.10.55	31.52	54.26.51
Feb. 24	languido	139314 136628	54.19.45 53.47.57	54.20.58 53.49. 9	31.49	54. 5. 3
Feb. 25	languido	137415 134777	53.57.21 53.25.34	53.58.33 53.26.45	31.48	53.42.39
Feb. 28	ut antea	131904 129418	52.50. 0 52.18.26	52.51. 9 52.19.34	31.35	52.35.21

Mar.

1711		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Mar. 1	clariſſimo	130127 127658	52.27.31 51.55.37	52.28.39 51.56.44	31.55	52.12.41
Mar. 2	languido	128349 125925	52. 4.37 51.32.46	52. 5.44 51.33.52	31.52	51.49.48
Mar. 4	Sole claro, cælo nubilo	124893 122543	51.18.59 50.47. 3	51.20. 4 50.48. 7	31.57	51. 4. 5
Mar. 9	Sole claro	116564 114438	49.22.26 48.51. 7	49.23.27 48.52. 7	31.20	49. 7.47
Mar. 11	clariſſimo	113407 111335	48.35.42 48. 4.13	48.36.41 48. 5.11	31.30	48.20.56
Mar. 12	ut antea	111879 109818	48.12.33 47.40.45	48.13.31 47.41.42	31.49	47.57.36
Mar. 13	Sole languido	110344 108323	47.48.55 47.17.17	47.49.52 47.18.13	31.39	47.34. 2
Mar. 15	ut antea	107334 105337	47. 1.33 46.29.20	47. 2.29 46.30.15	32.14	46.46.22
Mar. 25	ut antea	93516 91791	43. 4.52 42.32.58	43. 5.41 42.33.46	31.55	42.49.43
Mar. 26	Sole claro, cælo nubilo	92239 90541	42.41.18 42. 9.29	42.42. 6 42.10.16	31.50	42.26.11
Mar. 28	ut antea	89746 88084	41.54.25 41.22.30	41.55.12 41.23.16	31.56	41.39.14
Mar. 29	claro	88524 86891	41.31. 0 40.59.16	41.31.46 41. 0. 2	31.44	41.15.54
Apr. 3	languido	82683 81145	39.35. 6 39. 3.27	39.35.50 39. 4.10	31.40	39.20. 0
Apr. 7	ut antea	78329 76856	38. 4.16 37.32.40	38. 4.57 37.33.20	31.37	37.49. 8
Apr. 8	ut antea	77268 75826	37.41.34 37.10.19	37.42.14 37.10.58	31.16	37.26.36

Apr.

1711		*Tangentes correctæ apenumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Apr. 11	claro	74218 72809	36.34.56 36. 3.30	36.35.34 36. 4. 7	31.27	36.19.50
Apr. 12	clariſſimo	73232 71827	36.12.58 35.41.18	36.13.3[illegible] 35.41.54	31.41	35.57.44
Apr. 13	clariſſimo	72263 70871	35.51.11 35.19.32	35.51.48 35.20. 8	31.40	35.35.58
Apr. 14	clariſſimo	71304 69926	35.29.25 34.57.49	35.30. 1 34.58.24	31.37	35.14.12
Apr. 15	ut antea	70361 69001	35. 7.51 34.36.22	35. 8.26 34.36.57	31.29	34.52.41
Apr. 17	Sole languido	68518 67188	34.25. 5 33.53.47	34.25.40 33.54.22	31.18	34.10. 1
Apr. 18	claro	67614 66290	34. 3.51 33.32.25	34. 4.26 33.32.59	31.27	33.48.42
Apr. 22	clariſſimo	64171 62893	32.41.20 32.10. 1	32.41.53 32.10.33	31.20	32.26.13
Maj. 4	ut antea	55204 54018	28.54. 1 28.22.38	28.54.29 28.23. 5	31.24	28.38.47
Maj. 5	Sole claro, cælo nubilo	54545 53375	28.36.38 28. 5.28	28.37. 6 28. 5.55	31.11	28.21.30
Maj. 8	languido	52659 51502	27.46.17 27.14.58	27.46.44 27.15.24	31.20	27.31. 4
Maj. 9	ut antea	52057 50909	27.30. 0 26.58.50	27.30.26 26.59.16	31.10	26.59.51
Maj. 20	claro	46313 45214	24.51. 1 24.19.46	24.51.24 24.20. 8	31.16	24.35.46
Maj. 22	ut antea	45444 44345	24.26.21 23.54.55	24.26.43 23.55.17	31.26	24.11. 0
Maj. 27	ut antea	43503 42430	23.30.38 22.59.30	23.30.59 22.59.51	31. 8	23.15.25

Maj.

1711		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Maj. 28	Sole claro, cælo nubilo	43154 42081	23.20.32 22.49.19	23.20.53 22.49.40	31.13	23. 5.16
Maj. 31	ut antea	42195 41134	22.52.39 22.21.35	22.53. 0 22.21.55	31. 5	22.37.27
Jun. 1	ut antea	41899 40840	22.44. 0 22.12.55	22.44.21 22.13.15	31. 6	22.28.48
Jun. 3	ut antea	41353 40307	22.28. 0 21.57.11	22.28.20 21.57.31	30.49	22.12.55
Jun. 13	claro	39453 38404	21.31.51 21. 0.33	21.32.11 21. 0.53	31.14	21.16.30
Jun. 14	ut antea	39345 38301	21.28.39 20.57.27	21.28.19 20.57.46	31.13	21.13.22
Jun. 15	languido	39240 38204	21.25.32 20.54.33	21.25.52 20.54.52	31. 0	21.10.22
Jun. 16	claro	39152 38109	21.22.54 20.51.42	21.23.13 20.52. 1	31.12	21. 7.37
Jun. 17	claro	39103 38042	21.21.26 20.49.40	21.21.45 20.49.59	31.46	21. 5.52
Jun. 18	ut antea	39025 37973	21.19. 5 20.47.36	21.19.24 20.47.55	31.29	21. 3.39
Jun. 19	ut antea	38974 37931	21.17.35 20.46.22	21.17.54 20.46.41	31.13	21. 2.17
Jun. 22	ut antea	38923 37872	21.16. 4 20.44.35	21.16.23 20.44.54	31.29	21. 0.38
Jun. 23	clariſſimo	38931 37887	21.16.19 20.45. 1	21.16.38 20.45.20	31.18	21. 0.59
Jun. 25	Sole claro, cælo nubilo	38996 37952	21.18.15 20.46.58	21.18.34 20.47.17	31.17	21. 2.55
Jun. 26	ut antea	39049 38009	21.19.49 20.48.42	21.20. 8 20.49. 1	31. 7	21. 4.34

Jun.

1711		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 27	ut antea	39112 38075	21.21.42 20.50.40	21.22. 1 20.50.59	31. 2	21. 6.30
Jun. 28	nubilo	39200 38154	21.24.18 20.53. 3	21.24.38 20.53.22	31.16	21. 9. 0
Jul. 5	clariſſimo	40138 39091	21.52.11 21.21. 3	21.52.31 21.21.23	31. 8	21.36.57
Jul. 6	ut antea	40322 39277	21.57.38 21.26.36	21.57.58 21.26.56	31. 2	21.42.27
Jul. 8	ut antea	40741 39697	22.10. 0 21.39. 6	22.10.20 21.39.26	30.54	21.54.53
Jul. 9	Sole languido	40964 39927	22.16.37 21.45.55	22.16.57 21.46.15	30.42	22. 1.36
Jul. 13	claro	42027 40972	22.47.44 22.16.48	22.48. 5 22.17. 8	30.57	22.32.36
Jul. 18	claro	43652 42584	23.34.56 23. 3.59	23.35.17 23. 4.20	30.57	23.19.48
Aug. 1	claro	49970 48842	26.33. 5 26. 1.55	26.33.30 26. 2.19	31.11	26.17.54
Aug. 29	clariſſimo	70493 69128	35.10.53 34.39.20	35.11.28 34.39.55	31.33	34.55.41
Sept. 2	languido	74329 72916	36.37.23 36. 5.58	36.37.51 36. 6.35	31.16	36.22.13
Sept. 5	Sole claro, cælo nubilo	77357 75919	37.43.29 37.12.20	37.44.10 37.12.59	31.11	37.28.34
Sept. 9	ut antea	81630 80116	39.13.30 38.42. 1	39.14.13 38.42.43	31.30	38.58.28
Sept. 10	claro	82734 81191	39.36. 9 39. 4.25	39.36.53 39. 4. 8	32.45	39.20.30
Sept. 12	clariſſimo	84992 83420	40.21.43 39.50. 6	40.22.28 39.50.50	31.38	40. 6.39

Sept.

1711		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 15	ut antea	88515 86898	41.30.50 40.59.24	41.31.36 41. 0.10	31.26	41.15.53
Sept. 18	ut antea	92196 90507	42.40.29 42. 8.39	42.41.17 42. 9.26	31.51	42.25.21
Sept. 19	languido	93449 91762	43. 3.38 42.32.25	43. 4.27 42.33.13	31.14	42.48.50
Sept. 23	clariſſimo	98692 96904	44.37.23 44. 5.57	44.38.15 44. 6.48	31.27	44.22.31
Sept. 24	ut antea	100050 98239	45. 0.52 44.29.29	45. 1.44 44.30.20	31.24	44.46. 2
Sept. 30		108612 106627	47.21.51 46.50.14	47.22.48 46.51.10	31.38	47. 7.59
Oct. 3	languido	113148 111082	48.31.47 48. 0.23	48.32.46 48. 1.21	31.25	48.17. 3
Oct. 4	languido	114680 112610	48.54.43 48.23.40	48.55.43 48.24.39	31. 4	48.40.11
Oct. 5	languido	116284 114138	49.18.21 48.46.39	49.19.22 48.47.39	31.43	49. 3.30
Oct. 6	claro	117872 115698	49.41.23 49. 9.46	49.42.25 49.10.46	31.39	49.26.35
Oct. 8	languido	121132 118892	50.27.32 49.55.58	50.28.36 49.57. 1	31.35	50.12.48
Oct. 9	Sole claro, cælo nubilo	122803 120517	50.50.38 50.18.57	50.51.42 50.20. 1	31.41	50.35.51
Oct. 18	Sole languido	138730 136090	54.12.52 53.41.29	54.14. 4 53.42.40	31.24	53.58.22
Oct. 24	clariſſimo	150295 147296	56.21.43 55.49.38	56.23. 3 55.50.56	32. 7	56. 6.59
Oct. 27	clariſſimo	156390 153219	57.24. 9 56.52. 9	57.25.32 56.53.31	32. 1	57. 9.31

1712		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jan. 22	Sole languido	210088 205136	64.32.46 64. 0.42	64.34.40 64. 2.33	32. 7	64.18.36
Feb. 18	Sole claro	151495 148446	56.34.18 56. 2. 3	56.35.39 56. 3.22	32.17	56.19.30
Feb. 21	languido	145500 142730	55.30. 0 54.59. 2	55.31.17 55. 0.17	31. 0	55.15.47
Mar. 6	claro	120234 117980	50.14.58 49.42.56	50.16. 2 49.43.58	32. 4	50. 0. 0
Mar. 11	clariſſimo	112228 110174	48.17.52 47.46.18	48.18.51 47.47.15	31.36	48. 3. 3
Mar. 20	claro	99128 97317	44.44.57 44.13.16	44.45.49 44.14. 7	31.42	44.29.58
Mar. 28	clariſſimo	88803 87180	41.36.22 41. 4.55	41.37. 8 41. 5.41	31.27	41.21.24
Mar. 29	ut antea	87610 85988	41.13.18 40.41.31	41.14. 4 40.42.17	31.47	40.58.10
Mar. 30	ut antea	86422 84821	40.50. 3 40.18.18	40.50.49 40.19. 2	31.47	40.34.55
Apr. 5	Sole languido	79650 78159	38.32.15 38. 0.40	38.32.57 38. 1.21	31.36	38.17. 9
Apr. 9	clariſſimo	75463 74026	37. 2.21 36.30.40	37. 3. 0 36.31.19	31.42	36.47. 9
Apr. 10	ut antea	74459 73032	36.40.16 36. 8.29	36.40.54 36. 9. 6	31.48	36.25. 0
Jun. 18	claro	38993 37943	21.18. 9 20.46.42	21.18.28 20.47. 1	31.27	21. 2.44
Jun. 20	clariſſimo	38940 37885	21.16.35 20.44.58	21.16.54 20.45.17	31.37	21. 1. 5
Jun. 22	ut antea	38917 37889	21.16.30 20.45. 5	21.16.49 20.45.24	31.25	21. 1. 6

1712		Tangentes correctæ a penumbra	Dist. a vertice apparens limborum G ′ ″	Dist. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Dist. a vertice vera centri G ′ ″
Jun. 23	ut antea	38957 37910	21.17. 4 20.45.42	21.17.23 20.46. 1	31.22	21. 1.42
Jun. 24	ut antea	38995 37945	21.18.13 20.46.45	21.18.32 20.47. 4	31.28	21. 2.48
Sept. 20	ut antea	95728 93986	43.44.59 43.13.28	43.45.50 43.14.17	31.33	43.30. 3
1713						
Jun. 21	Sole clariſſimo	38927 37876	21.16.11 20.44.42	21.16.30 20.45. 1	31.29	21. 0.45
Jun. 22	ut antea	38934 37880	21.16.24 20.44.49	21.16.43 20.45. 8	31.35	21. 0.55
Nov. 9		185418 181370	61.39.40 61. 7.46	61.41.21 61. 9.24	31.57	61.25.22
Nov. 14		196443 192034	63. 1.17 62.29.31	63. 3. 3 62.31.15	31.48	62.47. 9
Nov. 21		211654 206653	64.42.36 64.10.39	64.44.32 64.12.31	32. 1	64.28.31
Nov. 24		217816 212617	65.20.24 64.48.40	65.22.23 64.50.35	31.48	65. 6.29
Nov. 25		219815 214476	65.32.17 65. 0.10	65.34.17 65. 2. 7	32.10	65.18.12
Nov. 26		221796 216387	65.43.52 65.11.48	65.45.54 65.13.46	32. 8	65.29.50
Nov. 27		223715 218218	65.54.56 65.22.48	65.56.59 65.24.47	32.12	65.40.53
Nov. 28		225622 220050	66. 5.47 65.33.40	66. 7.50 65.35.40	32.10	65.51.45
Dec. 2		232655 226810	66.44.27 66.12.27	66.46.35 66.14.31	32. 4	66.30.33

1714		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Aug. 1	Hujus anni obſervationes accepi a Paulo Balbo Med. Doct. & Anat. Prof., qui eas habuit, a me rogatus	50122 48993	26.37.17 26. 6. 7	26.37.42 26. 6.31	31.11	26.22. 6
Aug. 2		50666 49543	26.52.10 26.21.19	26.52.36 26.21.43	30.53	26.37. 9
Aug. 3		51238 50106	27. 7.47 26.36.50	27. 8.11 26.37.15	30.56	26.52.43
Aug. 6		53020 52236	27.55.58 27.33.31	27.56.25 27.33.58	22.27	. . .
Aug. 8		54274 53121	28.29.26 27.58.41	28.29.54 27.59. 8	30.46	28.14.31
Aug. 10		55556 54420	29. 3.18 28.33.19	29. 3.46 28.33.46	30. 0	28 48.46
Aug. 11		56251 55072	29.21.30 28.50.33	29.21.58 28.51. 1	30.57	29. 6.29
Aug. 14		58357 57152	30.16. 0 29.44.57	30.16.29 29.45.26	31. 3	30. 0.57
Aug. 16		59828 58606	30.53.29 30.22.23	30.53.59 30.22.52	31. 7	30.38.25
Aug. 23		65401 64117	33.11. 6 32.40. 0	33.11.39 32.40.33	31. 6	32.56. 6
Aug. 24		66254 64959	33.31.34 33. 0.27	33.32. 8 33. 1. 0	31. 8	33.16.34
Aug. 25		67126 65819	33.52.19 33.21. 9	33.52.54 33.21.42	31.12	33.37.18
Aug. 27		68898 67571	34.33.58 34. 2.51	34.34.33 34. 3.26	31. 7	34.18.59
Aug. 29	ſuſpecta	70739 69380	35.16.31 34.45.11	35.17. 6 34.45.46	31.20	35. 1.26

Aug.

1714		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 31		72636 71263	35.59.36 35.28.30	36. 0.13 35.29. 6	31. 7	35.44.39
Sept. 1		73609 72214	36.21.23 35.50. 5	36.22. 0 35.50.42	31.18	36. 6.21
Sept. 6		78677 77230	38.11.41 37.40.45	38.12.22 37.41.25	30.57	37.56.53
Sept. 8		80823 79334	38.56.46 38.25.36	38.57.29 38.26.18	31.11	38.41.53
Sept. 9		81921 80410	39.19.30 38.48.10	39.20.13 38.48.53	31.20	39. 4.33
Sept. 10		83032 81505	39.42.14 39.10.55	39.42.58 39.11.38	31.20	39.27.18
Sept. 12		85302 83745	40.27.54 39.56.41	40.28.39 39.57.25	31.14	40.13. 2
Sept. 14		87643 86047	41.13.56 40.42.40	41.14.42 40.43.26	31.16	40.59. 4
Sept. 15		88842 87224	41.37. 7 41. 5.47	41.37.53 41. 6.33	31.20	41.22.13
Sept. 16		90034 88416	41.59.53 41.28.56	42. 0.40 41.29.43	30.57	41.45.11
Sept. 18		92527 90848	42.46.38 42.15.17	42.47.26 42.16. 4	31.22	42.31.45
Sept. 19		93781 92089	43. 9.43 42.38.31	43.10.32 42.39.19	31.13	42.54.55
Sept. 20		95083 93356	43.33.23 43. 1.56	43.34.13 43. 2.45	31.28	43.18.29
Sept. 21		95383 94643	43.56.42 43.25.25	43.57.33 43.26.15	31.18	43.41.54
Sept. 22		97727 95948	44.20.30 43.48.56	44.21.21 43.49.47	31.34	44. 5.34

Sept.

1714		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 24		100380 98587	45. 6.52 44.35.33	45. 7.44 44.36.25	31.19	44.52. 4
Oct. 3		113566 111499	48.38. 5 48. 6.44	48.39. 4 48. 7.42	31.22	48.23.23
Oct. 5		116702 114564	49.24.26 48.53. 0	49.25.27 48.54. 0	31.27	49. 9.43
Oct. 6		118319 116130	49.46.22 49.16. 5	49.47.24 49.17. 6	30.18	49.32.15
Oct. 9		123251 120970	50.56.45 50.25.17	50.57.49 50.26.20	31.29	50.42. 4
Oct. 10		124932 122605	51.19.30 50.47.54	51.20.35 50.48.57	31.38	51. 4.46
Oct. 11		126636 124271	51.42.12 51.10.36	51.43.18 51.11.40	31.38	51.27.29
Oct. 13		130137 127688	52.27.39 51.56. 0	52.28.47 51.57. 7	31.40	52.12.57
Oct. 14		131903 129413	52.49.59 52.18.22	52.51. 8 52.19.30	31.38	52.35.19
Oct. 15		133701 131156	53.12.22 52.40.35	53.13.32 52.41.44	31.48	52.57.38
Oct. 16		135521 132939	53.34.36 53. 2.56	53.35.47 53. 4. 6	31.41	53.19.56
Oct. 21		144894 142117	55.23.17 54.52. 5	55.24.33 54.53.20	31.13	55. 8.56
Oct. 30		163162 159866	58.29.47 57.58.23	58.31.15 57.59.49	31.26	58.15.32
Oct. 31		165272 161898	58.49.24 58.17.51	58.50.53 58.19.18	31.35	58.35. 5
Nov. 5		176056 172294	60.24.12 59.52. 9	60.25.48 59.53.42	32. 6	60. 9.45

1715		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
*Jan.*6	Hujus quoque anni obſervationes a Balbo accepi	238808 232707	67.16.44 66.44.44	67.18.55 66.46.51	32. 4	67. 2.53
*Jan.*20		213716 208617	64.55.29 64.23.23	64.57.20 64.25.16	32. 4	64.41.18
*Jan.*21		211627 206625	64.42.29 64.10.28	64.44.24 64.12.19	32. 5	64.28.21
*Jan.*22		209483 204583	64.28.55 63.57. 2	64.30.49 63.58.53	31.56	64.14.51
*Jan.*26		200784 196194	63.31.28 62.59.31	63.33.17 63. 1.17	32. 0	63.17.17
*Jan.*31		189697 185525	62.12.14 61.40.30	62.13.56 61.42.10	31.46	61.58. 3
Feb. 1		187453 183373	61.55.18 61.23.41	61.57. 0 61.25.21	31.39	61.41.10
Feb. 3		183022 179061	61.20.55 60.49. 5	61.22.33 60.50.42	31.51	61. 6.37
Sept. 17		90982 89334	42.17.48 41.46.33	42.18.36 41.47.20	31.16	42. 2.58
*Sept.*18	dubia propter nubes	92223 90553	42.41. 0 42. 9.43	42.41.48 42.10.30	31.18	42.26. 9
Sept. 19		93460 91806	43. 3.48 42.33.15	43. 4.37 42.34. 3	30.34	42.49.20
*Sept.*22		97388 95638	44.14.31 43.43.22	44.15.22 43.44.12	31.10	43.59.47
*Sept.*23		98728 96943	44.38. 0 44. 6.39	44.38.52 44. 7.30	31.22	44.23.11
*Sept.*27		104281 102393	46.12. 2 45.40.39	46.12.57 45.41.22	31.35	45.57. 9

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1715			G ′ ″	G ′ ″	′ ″	G ′ ″
	Obſervatio hæc ſcripta erat apud Balbum ſine diei nota, & forte ad hoc temporis intervallum non pertinet	206350 201519	64. 8.40 63.36.29	64.10.32 64.38.18	32.14	64.54.25
Dec. 9		241935 235733	67.32.35 67. 0.47	67.34.48 67. 2.56	31.52	67.18.52
Dec. 11		244164 238271	67.43.41 67.13.58	67.45.55 67.16. 8	29.47	67.31. 1
	Deſiderantur obſervationes aliquot hoc temporis intervallo habitæ					
1717						
Jun. 26	ex ſcheda inter MS. Joſephi Antonii Nadii poſt ejus obitum reperta	39080 37950	21.20.45 20.46.55	21.21. 4 20.47.14		
Oct. 24	Haſce obſervationes tres habuit Bononia iter faciens Franciſcus Blanchinus. Excerpſi ex adverſariis poſt ejus obitum mihi traditis	151375 148355	56.33. 3 56. 1. 4	56.34.24 56. 2.23	32. 1	56.18.23
Oct. 25		153385 150290	56.53.51 56.21.40	56.55.13 56.23. 0	32.13	56.39. 6
Oct. 26		155414 152333	57.14.28 56.43. 0	57.15.51 56.44.21	31.30	57. 0. 6
1718						
Dec. 13	Sole ſubnubilo. Major tangens valde dubia. Hanc, & ſequentes hujus anni obſervationes habuit Joſ. Antonius Nadius Phil.D. ſed [illegible]i de inf. poſt diem 5 Dec. 1721	247011 240595	67.57.36 67.25.49	67.59.52 67.28. 1	31.51	67.43.56

Dec.

1718		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Dec. 19	Sole nubilo. Limbum inferiorem obſervare non licuit	242941	67.37.51	67.40. 4		
Dec. 20	Sole claro	249798 243178	68.10.57 67.38.47	68.13.14 67.41. 1	32.13	67.57. 8
Dec. 25	Sole pallido	249372 242770	68. 8.56 67.36.46	68.11.13 67.39. 0	32.13	67.55. 7
Dec. 26	Sole claro, cælo nubilo	248989 242385	68. 7. 6 67.34.50	68. 9.23 67.37. 4	32.19	67.53.13
1719						
Jan. 6	Sole claro. Hæc etiam cum octo ſequent. a Nadio tradita	238747 232592	67.16.24 66.44. 7	67.18.35 66.46.14	32.21	67. 2.24
Jan. 15	Sole claro, cælo nebuloſo	223697 218205	65.54.50 65.22. 4	65.56.53 65.24. 4	32.49	65.40.29
Jan. 22	cælo nebuloſo	209435 204517	64.28.36 63.56.36	64.30.28 63.58.28	32. 0	64.14.28
Jan. 29	ut antea	194097 189748	62.44.31 62.12.37	62.46.16 62.14.19	31.57	62.30.17
Feb. 2	ut antea	185185 181134	61.37.51 61. 5.52	61.39.31 61. 7.30	32. 1	61.23.30
Feb. 3	ut antea	182967 178994	61.20.29 60.48.32	61.22. 9 60.50. 9	32. 0	61. 6. 9
Mar. 17	cælo ſubnubilo	104337 102428	46.12.57 45.41.14	46.13.51 45.42. 7	31.44	45.57.59
Mar. 18	Sole pallido	102908 101025	45.49.16 45.17.32	45.50. 9 45.18.24	31.45	45.34.16
Apr. 4	Sole claro. Hactenus Nadius. Deinceps ego	81510 79986	39.11. 0 38.39.20	39.11.43 38.40. 3	31.40	38.55.53
Jun. 18	inter nubeculas	39024 37984	21.19. 6 20.47.56	21.19.25 20.48.15	31.10	21. 3.50

1719		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 21	Sole pallidiſſimo	38914 37897	21.15.47 20.45.29	21.16. 6 20.45.48	30.18	21. 0.57
Jun. 23	Sole clariſ. obſervatio optima	38936 37903	21.16.27 20.45.30	21.16.46 20.45.49	30.57	21. 1. 7
Jun. 24	Sole clariſ. ſpecie tremula	38957 37933	21.17. 5 20.46.24	21.17.24 20.46.43	30.41	21. 2. 3
Jun. 25	Sole clariſſimo	38998 37968	21.18.18 20.47.27	21.18.37 20.47.46	30.51	21. 3.11
Jun. 27	ægre inter nubes, Sole pallido	39107 38084	21.21.32 20.50.57	21.21.52 20.51.16	30.36	21. 6.34
Aug. 29	Sole clariſſimo. Uccellus	70550 69192	35.12.11 34.40.49	35.12.46 34.41.24	31.22	34.57. 5
Sept. 13	Cælo nubibus obducto inter hiatus nubium. Hanc obſervationem cum quatuor ſubſequentibus excerpſi e ſcheda Nadii manu exarata, poſt ejus obitum reperta	86211 84628	40.45.39 40.14.26	40.46.25 40.15.10	31.15	40.30.48
Sept. 18	Sole claro	92254 90580	42.41.35 42.10.14	42.42.24 42.11. 2	31.22	42.26.43
Sept. 21	Sole claro	96115 94352	43.51.53 43.20. 8	43.52.44 43.20.58	31.46	43.36.51
Sept. 25	Sole nebuloſo	101516 99660	45.25.51 44.54. 9	45.26.44 44.55. 1	31.43	45.10.52
Sept. 28	Sole nebuloſo	105736 103860	46.35.49 46. 5. 6	46.36.44 46. 6. 0	30.44	46.21.22
1720						
Mar. 24	Sole clariſſ. Ego & Nadius	93748 92026	43. 9. 6 42.37.20	43. 9.55 42.38. 8	31.47	42.54. 1
Maj. 28	Sole claro. Ego	42882 41816	23.12.39 22.41.35	23.13. 0 22.41.56	31. 4	22.57.28

Jun.

1720		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 14	inter nubes. Ego	39262 38223	21.26. 9 20.55. 6	21.26.29 20.55.25	31. 4	21.10.57
Jun. 20	Sole claro. Nadius hanc tradidit cum ſequentibus hujus anni	38934 37890	21.16.24 20.45. 6	21.16.43 20.45.25	31.18	21. 1. 4
Jun. 21		38919 37881	21.15.57 20.44.51	21.16.16 20.45.10	31. 6	21. 0.43
Jul. 11		41690 40641	22.37.53 22. 7. 3	22.38.14 22. 7.23	30.51	22.22.48
Aug. 5		52727 51584	27.48. 5 27.17.11	27.48.32 27.17.37	30.55	27.33. 4
Oct. 21	Obſervabat cum Nadio Franciſcus Blanchinus Bononia tranſiens	145930 143101	55.34.44 55. 3.14	55.36. 1 55. 4.29	31.32	55.20.15
Oct. 24		151898 148871	56.38.30 56. 6.36	56.39.51 56. 7.55	31.56	56.23.53
1721						
Jan. 9	Sole claro. Nadius	233503 227580	66.48.59 66.16.44	66.51. 7 66.18.48	32.19	66.34.57
Jan. 20	Nadius	212705 207572	64.49.13 64.16.[illegible]8	64.51. 9 64.18.30	32.39	64.34.49
Jun. 10	Sole pallido. Nadius	39796 38748	21.42. 3 21.10.51	21.42.23 21.11.10	31.13	21.26.46
Jun. 22	Sole pallido. Ego	38908 37893	21.15.37 20.45.12	21.15.56 20.45.31	30.26	21. 0.44
Jun. 23	Sole claro, ſpecie tremula. Ego	38942 37905	21.16.40 20.45.34	21.16.59 20.45.53	31. 6	21. 1.26
Jun. 24	Sole clariſſimo. Ego	38980 37938	21.17.46 20.46.34	21.18. 5 20.46.53	31.12	21. 2.29

1721		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 7	Sole claro. Nadius	53824 52660	28.17.28 27.46.18	28.17.55 27.46.45	31.10	28. 2.10
Sept. 2	Nadius	74889 73476	36.49.45 36.18.25	36.50.23 36.19. 3	31.20	36.34.43
Sept. 4	Sole pallido. Idem	76901 75478	37.33.39 37. 2.42	37.34.19 37. 3.21	30.58	37.18.50
Sept. 13	nubilo. Idem	86801 85223	40.57.29 40.26.19	40.58.15 40.27. 4	31.11	40.42.39
Sept. 25	Sole nonnihil obfuſcato	102224 100356	45.37.49 45. 6. 7	45.38.42 45. 6.59	31.43	45.22.50
Sept. 26	claro	103621 101695	46. 1. 8 45.28.55	46. 2. 2 45.29.48	32.14	45.45.55
Sept. 27	claro	105057 103057	46.24.46 45.51.46	46.25.41 45.52.40	32. 1	46. 8.40
Sept. 28	claro	106502 104569	46.48.12 46.16.46	46.49. 7 46.17.41	31.26	46.33.24
Sept. 29	claro	107972 106007	47.11.43 46.40.13	47.12.39 46.41. 9	31.30	46.56.54
Sept. 30	ſub pallido. Ego cum Nadio	109469 107411	47.35.18 47. 2.47	47.36.15 47. 3.43	32.32	47.19.59
Oct. 1	ſub pallido. Nadius	110974 108945	47.58.40 47.27. 5	47.59.38 47.28. 2	31.36	47.43.50
Oct. 3	pallido inter nubes	114035 111956	48.45. 6 48.13.43	48.46. 5 48.14.41	31.24	48.30.24
Oct. 6	Sole claro. Nadius	118795 116612	49.54.36 49.23. 8	49.55.38 49.24. 9	31.29	49.39.53
Oct. 13	pallido, inter nubes. Nadius	130641 128191	52.34. 4 52. 2.34	52.35.13 52. 3.41	31.32	52.19.27
Oct. 27	claro. Ego hodie & deinceps	157538 154356	57.35.39 57. 3.46	57.37. 3 57. 5. 8	31.55	57.21. 5

1721		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Oct. 28	claro	159622 156391	57.56. 1 57.24.16	57.57.27 57.25.40	31.47	57.41.33
Nov. 1	claro	168021 164554	59.14.26 58.42.47	59.15.57 58.44.15	31.42	59. 0. 6
Nov. 2	claro	170178 166626	59.33.39 59. 1.49	59.35.11 59. 3.19	31.52	59.19.15
Nov. 6	claro	178903 175059	60.47.48 60.15.49	60.49.25 60.17.24	32. 1	60.33.24
Nov. 7	claro	181106 177193	61. 5.39 60.33.42	61. 7.17 60.35.18	31.59	60.51.18
Nov. 9	clariſſimo tremulo	185505 181481	61.40.20 61. 8.40	61.42. 1 61.10.18	31.43	62.26. 9
Nov. 10	clariſſimo tremulo	187720 183614	61.57.20 61.25.35	61.59. 2 61.27.15	31.47	61.43. 8
Nov. 11	ſpecie languidiſſima	189876 185747	62.13.34 61.42.12	62.15.17 61.43.53	31.24	61.59.35
Nov. 12	clariſſimo,& valde tremulo	192142 187875	62.30.19 61.58.30	62.32. 3 62. 0.12	31.51	62.16. 7
Nov. 13	ſpecie languidiſſima	194339 190065	62.46.17 62.14.58	62.48. 2 62.16.41	31.21	62.32.21
Nov. 19	Sole pallido	207508 202649	64.16.13 63.44. 8	64.18. 6 63.45.58	32. 8	64. 2. 2
Nov. 20	Sole clariſſimo, & tremulo	209625 204708	64.29.49 63.57.52	64.31.43 63.59.43	32. 0	64.15.43
Nov. 27	Sole pallido	223825 218371	65.55.33 65.23.43	65.57.36 65.25.42	31.54	65.41.39
Dec. 1	Sole clariſſimo	231083 225294	66.35.59 66. 3.55	66.38. 5 66. 5.58	32. 7	66.22. 1
Dec. 3	exacta clariſſimo	234356 228433	66.53.31 66.21.28	66.55.40 66.23.33	32. 7	66.39.36

1721		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Dec. 4	clariſſimo exacta	235938 229934	67. 1.51 66.29.44	67. 4. 0 66.31.50	32.10	66.47.55
Dec. 5	clariſſimo	237390 231352	67. 9.28 66.37.26	67.11.38 66.39.32	32. 6	66.55.35
	Diebus 13, & 16 cælo ſudo ſpeciei Solaris pars, quæ inferiori parti Solis reſpondet prope meridiem fere evaneſcebat, imbricis cujuſdam, in tecto prominentis, objectu. Eum imbricem amovi die 19. Forte autem luxari ille cæperat Solemque intercipere ante triennium in hac hyberna cæli plaga, memini enim Nadium cum obſervationes Decembri 1718 habitas mihi traderet, monuiſſe limbi inferioris imaginem, etſi clarum eſſet cælum, ægre diſtingui					
Dec. 27	Sole clariſſimo	248355 241794	68. 4. 4 67.31.52	68. 6.20 67.34. 5	32.15	67.50.12
Dec. 28	Sole ſubpallido	247770 241263	68. 1.15 67.29.12	68. 3.31 67.31.24	32. 7	67.47.27
Dec. 29	Sole claro. Nadius	247105 240584	67.58. 3 67.25.46	68. 0.19 67.27.58	32.21	67.44. 8
1722						
Jan. 4	Sole clariſſimo. Ego	240997 234750	67.27.52 66.55.37	67.30. 4 66.57.46	32.18	67.13.55
Jan. 5	ut antea	239738 233580	67.21.28 66.49.24	67.23.40 66.51.31	32. 9	67. 7.35

1722		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan.6	ſubpallido	238386 232263	67.14.33 66.42.21	67.16.44 66.44.28	32.16	67. 0.36
Jan.7	claro	236950 230911	67. 7. 8 66.35. 3	67. 9.17 66.37. 9	32. 8	66.53.13
Jan.8	clariſſimo. Ego cum Nadio	235460 229480	66.59.21 66.27.14	67. 1.30 66.29.20	32.10	66.45.25
Jan.9	ut heri. Ego cum Nadio	233860 227958	66.50.54 66.18.51	66.53. 2 66.20.56	32. 6	66.36.59
Jan.10	claro. Ego cum Nadio	232209 226394	66.42. 4 66.10. 7	66.44.11 66.12.11	32. 0	66.28.11
Jan.13	claro. Idem	226950 221313	66.13.14 65.41. 4	66.15.18 65.43. 5	32.13	65.59.11
Jan.14	claro. Idem	225101 219546	66. 2.50 65.30.41	66. 4.53 65.32.41	32.12	65.48.47
Jan.15	claro. Ego	223175 217728	65.51.50 65.19.52	65.53.53 65.21.51	32. 2	65.37.52
Jan.17	claro	219243 213973	65.28.54 64.57. 4	65.30.54 64.59. 1	31.53	65.14.57
Jan.18	claro	217224 212023	65.16.51 64.44.57	65.18.50 64.46.52	31.58	65. 2.51
Jan.19	claro. Ego & Nadius	215181 210043	65. 4.29 64.32.29	65. 6.26 64.34.23	32. 3	64.50.24
Jan.20	claro. Ego	213114 208053	64.51.45 64.19.44	64.53.41 64.21.37	32. 4	64.37.39
Jan.21	claro	210988 206022	64.38.27 64. 6.32	64.40.22 64. 8.23	31.59	64.24.23
Jan.22	claro	208854 203942	64.24.53 63.52.47	64.26.47 63.54.38	32. 9	64.10.42
Jan.25	claro	202320 197671	63.41.55 63. 9.56	63.43.44 63.11.43	32. 1	63.27.43

Jan.

1722		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jan. 26	claro	200147 195562	63.27. 5 62.55. 2	63.28.53 62.56.48	32. 5	63.12.50
Jan. 27	claro	197931 193440	63.11.45 62.39.47	63.13.32 62.41.32	32. 0	62.57.32
Jan. 28	claro	195701 191302	62.56. 2 62.24. 9	62.57.48 62.25.53	31.55	62.41.50
Jan. 29	claro	193485 189154	62.40. 7 62. 8. 9	62.41.52 62. 9.51	32. 1	62.25.51
Feb. 4	inter nubes	180144 176271	60.57.54 60.26. 0	60.59.32 60.27.36	31.56	60.43.34
Feb. 6	cælo ſubnubilo	175710 171976	60.21.18 59.49.23	60.22.55 59.50.56	31.57	60. 6.54
Feb. 8	Sole nebuloſo	171296 167728	59.43.28 59.11.48	59.45. 1 59.13.19	31.42	59.29.10
Feb. 9	Sole ſubnubilo. Cum Nadio	169138 165634	59.24.26 58.52.44	59.25.58 58.54.14	31.44	59.10. 6
Feb. 10	Sole languido	166987 163561	59. 5. 5 58.33.31	59. 6.35 58.34.59	31.36	58.50.47
Feb. 11	claro. Cum Nadio	164842 161513	58.45.27 58.14.11	58.46.56 58.15.38	31.18	58.31.17
Feb. 12	clariſſimo	162744 159454	58.25.52 57.54.24	58.27.20 57.55.50	31.30	58.11.35
Feb. 13	claro	160655 157390	58. 5.59 57.34.11	58. 7.25 57.35.35	31.50	57.51.30
Feb. 17	claro	152351 149304	56.43.12 56.11.13	56.44.33 56.12.32	32. 1	56.28.32
Feb. 18	claro	150326 147343	56.22. 3 55.50. 9	56.23.23 55.51.28	31.55	56. 7.25
Feb. 19	claro	148307 145390	56. 0.33 55.28.52	56. 1.52 55.30. 9	31.43	55.46. 0

Feb.

1722		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 20	claro. Cum Nadio	146319 143470	55.38.59 55. 7.24	55.40.16 55. 8.39	31.37	55.24.27
Feb. 21	clariſſimo, & tremulo	144363 141581	55.17.23 54.45.58	55.18.39 54.47.12	31.27	55. 2.55
Feb. 22	ut antea. Cum Nadio	142454 139712	54.55.55 54.24.23	54.57.10 54.25.36	31.34	54.41.23
Feb. 23	ut antea. Cum eodem	140542 137842	54.34. 2 54. 2.25	54.35.16 54. 3.37	31.39	54.19.26
Feb. 24	ut ſupra. Cum eodem	138720 136005	54.12.47 53.40.28	54.13.59 53.41.39	32.20	53.57.49
Feb. 25	☼ claro	136807 134182	53.50. 6 53.18.16	53.51.18 53.19.27	31.51	53.35.22
Mar. 2	☼ clariſſimo. Cum Nadio	127771 125380	51.57. 6 51.25.30	51.58.13 51.26.35	31.38	51.42.24
Mar. 8	clariſſimo. Cum eodem	117665 115493	49.38.24 49. 6.44	49.39.25 49. 7.44	31.41	49.23.34
Mar. 13	clariſſimo. Nadius	109845 107822	47.41. 9 47. 9.20	47.42. 6 47.10.16	31.50	47.26.11
Mar. 14	ſubpallido. Ego	108322 106346	47.17.16 46.45.42	47.18.12 46.46.38	31.34	47. 2.25
Mar. 17	ſubpallido. Nadius	103941 202042	46. 6.26 45.34.45	46. 7.20 45.35.38	31.42	45.51.29
Mar. 18	ut antea. Nadius	102516 100640	45.42.43 45.10.58	45.43.36 45.11.50	31.46	45.27.43
Mar. 19	ut antea. Nadius	101121 99264	45.19.10 44.47.19	45.20. 2 44.48.11	31.51	45. 4. 6
Mar. 20	pallido. Ego cum Nadio	99706 97918	44.54.57 44.23.50	44.55.49 44.24.41	31. 8	44.40.15
Mar. 21	claro. Ego	98364 96567	44.31.39 43.59.59	44.32.30 44. 0.50	31.40	44.16.40

1722		Tangentes correctæ apenumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 27	Sole pallido. Nadius	90553 88923	42. 9.44 41.38.40	42.10.31 41.39.27	31. 4	41.54.59
Mar. 28	ſubpallido. Ego	89327 87698	41.46.25 41.15. 0	41.47.12 41.15.46	31.26	41.31.29
Mar. 29	claro. Cum Nadio	88123 86503	41.23.16 40.51.39	41.24. 2 40.52.25	31.37	41. 8. 3
Mar. 30	ſubpallido	86921 85322	40.59.52 40.28.18	41. 0.38 40.29. 3	31.35	40.44.50
Apr. 1	ſubpallido	84585 83023	40.13.35 39.42. 3	40.14.19 39.42.47	31.32	39.58.33
Apr. 4	inter nubes ſpecie minime tremula. Cum Nadio	81201 79698	39. 4.38 38.33.14	39. 5.21 38.33.56	31.25	38.49.38
Apr. 5	claro. Cum eodem	80111 78615	38.41.55 38.10.22	38.42.37 38.11. 3	31.34	38.26.50
Apr. 6	ſubnubilo. Cum eodem	79024 77557	39.19. 3 37.47.47	38.19.44 37.48.27	31.17	38. 4. 5
Apr. 7	☼ claro. Nadius	77964 76511	37.56.29 37.25.13	37.57.10 37.25.53	31.17	37.41.31
Apr. 9	ſubpallido. Ego	75889 74502	37.11.41 36.41.13	37.12.20 36.41.52	30.28	36.57. 6
Apr. 11	claro	73889 72475	36.27.38 35.55.58	36.28.16 35.56.35	31.41	36.12.25
Apr. 12	claro	72906 71514	36. 5.40 35.34.13	36. 6.17 35.34.50	31.27	35.50.33
Apr. 13	pallido	71941 70557	35.43.55 35.12.21	35.44.32 35.12.57	31.35	35.28.44
Apr. 14	claro	70981 69606	35.22. 3 34.50.25	35.22.39 34.51. 1	31.38	35. 6.50
Apr. 17	languido	68196 66877	34.17.34 33.46.24	34.18. 9 33.46.59	31.10	34. 2.34

1722		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 27	clariſſimo	59941 58704	30.56.20 30.24.54	30.56.50 30.25.23	31.27	30.41. 6
Apr. 28	ut antea	59189 57968	30.37.15 30. 6. 0	30.37.45 30. 6.29	31.16	30.22. 7
Apr. 30	cælo ſubnubilo	57733 56521	29.59.57 29.28.33	30. 0.26 29.29. 1	31.25	29.44.43
Maj. 1	cælo nubilo. Deinceps obſervabat Jo: Baptiſta Banderius J. U. D. interdum cum Nadio, aut mecum	57017 55825	29.41.26 29.10.22	29.41.55 29.10.51	31. 4	29.26.23
Maj. 4	Sole pallido	54972 53814	28.47.55 28.17.11	28.48.23 28.17.38	30.45	28.33. 0
Maj. 6	inter nubes	53690 52534	28.13.55 27.42.54	28.14.22 27.43.21	31. 1	27.58.51
Maj. 7	nubilo	53064 51912	27.57. 9 27.26. 5	27.57.36 27.26.31	31. 5	27.42. 3
Maj. 9	ſubnubilo	51845 50716	27.24.16 26.53.33	27.24.42 26.53.59	30.43	27. 9.20
Maj. 10	claro	51266 50141	27. 8.33 26.37.47	27. 8.59 26.38.12	30.47	26.53.35
Maj. 11	clariſſimo	50695 49565	26.52.59 26.21.57	26.53.25 26.22.22	31. 3	26.37.53
Maj. 12	ut antea	50141 49018	26.37.47 26. 6.48	26.38.12 26. 7.12	31. 0	26.22.42
Maj. 13	Sole claro	49599 48480	26.22.52 25.51.51	26.23.17 25.52.15	31. 2	26. 7.46
Maj. 14	pallido	49055 47951	26. 7.48 25.37. 5	26. 8.12 25.37.29	30.43	25.52.50
Maj. 19	Sole claro, cælo nubilo	46607 45515	24.59.20 24.28.22	24.59.43 24.28.44	30.59	24.44.14

1722		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Maj. 21	☼ pallido	45717 44632	24.34. 2 24. 3. 9	24.34.25 24. 3.31	30.54	24.18.58
Maj. 22	☼ nubilo	45288 44210	24.21.55 23.51. 1	24.22.18 23.51.23	30.55	24. 6.50
Maj. 25	claro	44105 43026	23.48. 0 23.16.49	23.48.22 23.17.10	31.12	23.32 46
Maj. 26	claro	43734 42665	23.37.18 23. 6.22	23.37.40 23. 6.43	30.57	23.22.11
Maj. 27	claro	43378 42316	23.27. 1 22.56.10	23.27.22 22.56.31	30.51	23.11.56
Maj. 31	nubilo	42089 41032	22.49.34 22.18.35	22.49.55 22.18.55	31. 0	22.34.25
Jun. 2		41535 40478	22.33.21 22. 2.14	22.33.42 22. 2.34	31. 8	22.18. 8
Jun. 3	claro	41272 40219	22.25.37 21.54.35	22.25.57 21.54.55	31. 2	22.16.26
Jun. 4		41022 39972	22.18.18 21.47.16	22.18.38 21.47 36	31. 2	22. 3. 7
Jun. 6	claro	40574 39526	22. 5. 5 21.34. 2	22. 5.25 21.34.22	31. 3	21.49.53
Jun. 7		40368 39317	21.59. 0 21.27.49	21.59.20 21.28. 9	31.11	21.43.44
Jun. 9		39993 38948	21.47.53 21.16.49	21.48.13 21.17. 8	31. 5	21.32.40
Jun. 12	ſereniſſimo cælo. Per hos dies meridianæ hujuſce lineæ examen eſt habitum	39537 38501	21.34.21 21. 3.27	21.34.40 21. 3.46	30.54	21.19.13
Jun. 13	ut antea	39415 38383	21.30.40 20.59.55	21.31.59 21. 0.14	31.45	21.16. 6

Jun.

1722		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 14	ut antea	39307 38265	21.27.31 20.56.23	21.27.50 20.56.42	31. 8	21.12.26
Jun. 15	ut antea	39212 38177	21.24.41 20.53.44	21.25. 0 20.54. 3	30.57	21. 9.31
Jun. 16	☼ claro	39129 38089	21.22.12 20.51. 6	21.22.31 20.51.25	31. 6	21. 6.58
Jun. 18	☼ claro, cælo nubilo	39013 37968	21.18.46 20.47.27	21.19. 5 20.47.46	31.19	21. 3.26
Jun. 20	ſubnubilo	38930 37900	21.16.17 20.45.25	21.16.36 20.45.44	30.52	21. 1.10
Jun. 21	☼ claro, cælo nubilo	38919 37889	21.15.57 20.45. 6	21.16.16 20.45.25	30.51	21. 0.50
Jun. 22	Sole clariſſimo	38926 37889	21.16. 9 20.45. 6	21.18.28 20.45.25	31. 3	21. 0.56
Jun. 23		38934 37902	21.16.24 20.45.29	21.16.43 20.45.48	30.55	21. 1.15
Jun. 25		39015 37979	21.18.49 20.47.53	21.19. 8 20.48.12	30.56	21. 3.40
Jun. 26		39070 38032	21.20.27 20.49.23	21.20.46 20.49.42	31. 4	21. 5.14
Jun. 27	Sole pallido	39135 38094	21.22.23 20.51.15	21.22.43 20.51.34	31. 9	21. 7. 9
Jun. 29	claro	39318 38282	21.27.51 20.56.56	21.28.10 20.57.16	30.54	21.12.43
Jun. 30		39430 38392	21.31.11 21. 0.11	21.31.31 21. 0.30	31. 1	21.16. 0
Jul. 1		39554 38513	21.34.51 21. 3.49	21.35.11 21. 4. 8	31. 3	21.19.40
Jul. 2		30693 38655	21.39. 0 21. 8. 2	21.39.20 21. 8.21	30.59	21.23.51

1722		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jul. 3	claro	39845 38801	21.43.30 21.12.25	21.43.51 21.12.45	31. 6	21.28.18
Jul. 4	cælo nubilo	40011 38974	21.48.25 21.17.35	21.48.46 21.17.55	30.51	21.33.20
Jul. 5	ſubnubilo	40186 39150	21.53.37 21.22.49	21.53.58 21.23. 9	30.49	21.38.34
Jul. 6		40386 39343	21.59.32 21.28.35	21.59.53 21.28.55	30.58	21.44.24
Jul. 7		40594 39548	22. 5.41 21.34.41	22. 6. 2 21.35. 1	31. 1	21.50.31
Jul. 8		40815 39767	22.12.11 21.41.11	22.12.32 21.41.31	31. 1	21.57. 1
Jul. 10		41299 40248	22.26.23 21.55.26	21.26.44 21.55.46	30.58	22.11.15
Jul. 11		41582 40504	22.34.44 22. 3. 0	22.34. 5 22. 3.20	30.45	22.18.43
Jul. 12		41836 40778	22.42.10 22.11. 5	22.42.31 22.11.26	31. 5	22.26.58
Jul. 25		46636 45540	25. 0.10 24.29. 5	25. 0.33 24.29.28	31. 5	24.45. 0
Aug. 5		52440 51294	27.40.22 27. 9.19	27.40.49 27. 9.45	31. 4	27.25.17
Aug. 18		61390 60154	31.32.45 31. 1.43	31.33.16 31. 2.13	31. 3	31.17.45
Aug. 19		62178 60920	31.52.22 31.21. 0	31.52.53 31.21.30	31.23	31.37.12
Aug. 22		64613 63331	32.52. 4 32.20.48	32.52.37 32.21.20	31.17	32.36.58
Aug. 23		65444 64166	33.12. 9 32.41.13	33.12.42 32.41.45	30.57	32.57.13

1722		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Aug. 27		68958 67619	34.35.22 34. 3.59	34.35.56 34. 4.32	31.24	34.20.14
Aug. 29		70789 69428	35.17.40 34.46.15	35.18.15 34.46.50	31.25	35. 2.32
Sept. 3		75643 74221	37. 6.18 36.35. 0	37. 6.57 36.35.38	31.19	36.51.18
Sept. 5	Sole clariſſimo	77686 72638	37.50.33 37.19.17	37.51.14 37.19.57	31.17	37.35.35
Sept. 6	nubilo	78734 77272	38.12.54 37.41.39	38.13.35 37.42.20	31.15	37.57.57
Sept. 8	clariſſimo	80876 79381	38.57.53 38.26.23	38.58.36 38.27. 5	31.31	38.42.40
Sept. 9	obſervante Jo Jacobo Parma Philoſ. Doct.	81960 80456	39.20.17 38.49. 7	39.21. 0 38.49.49	31.11	39. 5.34
Sept. 15	Banderius iterum	88906 87276	41.38.21 41. 6.48	41.39. 8 41. 7.34	31.34	41.23.21
Sept. 16	cælo clariſſimo	90115 88475	42. 1.26 41.30. 4	42. 2.14 41.30.51	31.23	41.46.33
Sept. 17	clariſſimo	91342 89686	42.24.34 41.53.16	42.25.22 41.54. 4	31.18	42. 9.43
Sept. 18	ut antea	92595 90904	42.47.53 42.16.19	42.48.42 42.17. 7	31.35	42.32.54
Sept. 19	ut antea	93866 92155	43.11.17 42.39.43	43.12. 6 42.40.31	31.35	42.56.18
Sept. 20	ut antea	95151 93421	43.34.36 43. 3. 7	43.35.26 43. 3.56	31.30	43.18.41
Sept. 22	claro	97791 96007	44.21.37 43.49.59	44.22.28 43.50.50	31.38	44. 6.39
Sept. 24	nonnihil dubia	100503 98672	45. 8.39 44.37. 1	45. 9.31 44.37.52	31.39	44.53.41

Sept.

1722		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 25	Sole pallido	101884 100022	45.32. 5 45. 0.23	45.32.58 45. 1.15	31.43	45.17. 6
Sept. 27	Sole pallido	104705 102802	46.19. 0 45.47.30	46.19.54 45.48.23	31.31	4⁶. 4. 8
Sept. 28	ut antea	106148 104214	46.42.30 46.10.56	46.43.26 46.11.50	31.36	46.27.38
Sept. 30	ſubnubilo	109091 107090	47.29.22 46.57.39	47.30.19 46.58.35	31.44	47.14.27
Oct. 2	claro	112116 110067	48.16. 9 47.48.38	48.17. 7 47.45.35	31.32	48. 1.21
Oct. 6	claro	118392 116216	49.48.51 49.17.21	49.49.54 49.18.21	31.33	49.34. 7
Oct. 8	pallido	121678 119428	50.35. 8 50. 3.35	50.36.12 50. 4.38	31.34	50.20.25
Oct. 9	claro	123350 121060	50.58. 7 50.26.32	5c.59.12 50.27.36	31.36	50.43.24
Oct. 10	nubilo	125024 122718	51.20.45 50.49.28	51.21.51 50.50.32	31.19	51. 6.11
Oct. 11	claro	126746 124380	51.43.39 51.12. 5	51.44 45 51.13.10	31.35	51.28.57
Oct. 12	claro	128482 126082	52. 6.21 51.34.51	52. 7.29 51.35.57	31.32	51.51.43
Oct. 13	clariſſimo	130220 127796	52.28.42 51.57.25	52.29.51 51.58.33	31.18	52.14.12
Oct. 14	claro	132002 129514	52.51.14 52.19.25	52.52.24 52.20.34	31.50	52.36.29
Oct. 15	pallido	133817 131275	53.13.47 52.42. 5	53.14.57 52.43.15	31.42	52.59. 6
Oct. 16	claro	135637 133050	53.36. 0 53. 4.18	53.37.11 53. 5.28	31.43	53.21.19

Oct.

1722		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Oct. 17	pallido	137462 134840	53.57.54 53.26.19	53.59. 6 53.27.30	31.36	53.43.18
Oct. 18	Sole pallido dubia	139346 136671	54.20. 9 53.48.29	54.21.21 53.49.40	31.41	54. 5.30
Oct. 24	claro	150918 147934	56.28.16 55.56.32	56.29.36 55.57.51	31.45	56.23.43
Oct. 25	claro	152950 149890	56.49.23 56.17.26	56.50.44 56.18.45	31.59	56.34.45
Oct. 29	pallido	161194 157908	58.11. 7 57.39.17	58.12.33 57.40.41	31.52	57.56.37
Oct. 30	claro	163260 159957	58.30.42 57.59.16	58.32.10 58. 0.42	31.28	58.16.26
Oct. 31	claro	165365 161998	58.50.16 58.18.48	58.51.46 58.20.14	31.32	58.36. 0
Nov. 1	claro	167482 164031	59. 9.34 58.37.55	59.11. 4 58.39.23	31.41	58.55.13
Nov. 8	pallido	182753 178801	61.18.48 60.46.58	61.20.26 60.48.34	31.52	61. 4.30
Nov. 9	claro	184968 180967	61.36.10 61.41.32	61.37.50 61. 6.10	31.40	61.22. 0
Nov. 10	pallido	187187 183076	61.53.16 61.21.21	61.54.59 61.23. 0	31.59	61.39. 0
Nov. 20	claro	209145 204204	64.26.49 63.54.32	64.28.41 63.56.22	32.19	64.12.31
Nov. 21	claro	211238 206281	64.40. 2 64. 8.13	64.41.57 64.10. 5	31.52	64.26. 1
Nov. 22	claro	213335 208270	64.53. 8 64.21. 8	64.55. 5 64.23. 2	32. 3	64.39. 3
Nov. 23	claro	215378 210250	65. 5.40 64.33.48	65. 7.37 64.35.42	31.55	64.51.40

1722		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Nov. 26	claro	221393 216050	65.41.32 65. 9.46	65.43.34 65.11.44	31.50	65.27.39
Nov. 27	claro	223345 217883	65.52.49 65.20.48	65.54.51 65.22.47	32. 4	65.38.49
Nov. 28	claro	225247 219714	66. 3.39 65.31.40	66. 5.42 65.33.40	32. 2	65.49.41
Nov. 29	claro	227115 221478	66.14. 9 65.42. 1	66.16.13 65.44. 2	32.11	66. 0. 7
Nov. 30	claro	228877 223191	66.23.56 65.51.54	66.26. 1 65.54. 2	31.59	66.10. 2
Dec. 6	claro, cælo nubilo	238469 232378	67.14.59 66.42.58	67.17. 9 66.45. 5	32. 4	67. 1. 7
Dec. 7	claro	239813 233706	67.21.51 66.50. 5	67.24. 2 66.52.13	31.49	67. 8. 7
Dec. 11	dubia	244436 238151	67.45. 1 67.13.21	67.47.15 67.15.32	31.43	67.31.23
Dec. 12	dubia	245380 239080	67.49.39 67.18. 7	67.51.54 67.20.18	31.36	67.36. 6
Dec. 21	Sole nonnihil nebula involuto. Ego cum Banderio	249933 243[illegible]95	68.11.36 67.39.22	68.13.53 67.41.35	32.18	67.57.44
Dec. 22	Sole ſubpallido. Ego cum Banderio	249984 243299	68.11.51 67.39.23	68.14. 8 67.41.36	32.32	67.57.52
Dec. 27	Sole claro. Banderius	248500 241956	68. 4.46 67.32.49	68. 7. 2 67.35. 1	32. 1	67.51. 1
Dec. 28	clariſſimo	247950 241398	68. 2. 7 67.29.53	68. 4.23 67.32. 5	32.18	67.48.14
Dec. 30	claro	246508 240050	67.55. 9 67.23. 4	67.57.25 67.25.16	32. 9	67.41.20

Jan.

1723		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 4	Sole claro. Banderius	241339 235160	67.29.35 66.57.15	67.31.47 66.59.24	32.23	67.15.35
Jan. 6	claro. Ego	238710 232607	67.16.13 66.44.12	67.18.23 66.46.20	32. 3	67. 2.21
Jan. 7	claro. Banderius	237320 231268	67. 9. 3 66.36.59	67.11.12 66.39. 4	32. 8	66.55. 8
Jan. 12	claro	229167 223470	66.25.28 65.53.32	66.27.32 65.55.35	31.57	66.11.33
Jan. 13	claro	227404 221743	66.15.46 65.43.24	66.17.49 65.45.36	32.13	66. 1.42
Jan. 15	claro	223659 218168	65.54.37 65.22.31	65.56.40 65.24.31	32. 9	65.40.35
Jan. 16	claro	221726 216329	65.43.28 65.11.27	65.45.27 65.13.24	32. 3	65.28.25
Jan. 17	ſubnubilo	219732 214430	65.31.47 64.59.56	65.33.47 65. 1.53	31.54	65.17.50
Jan. 25	dubia propter nives foramen obſtruentes	202847 198227	63.45.26 63.13.49	63.47.16 63.15.37	31.39	63.31.27
Jan. 30	Sole pallido	191792 187505	62.27.45 61.55.42	62.29.30 61.57.24	32. 6	62.13.27
Jan. 31	claro	189562 185401	62.11.13 61.39.31	62.12.57 61.41.11	31.46	61.57. 4
Feb. 1	claro	187241 183230	61.54.27 61.22.34	61.56.10 61.24.13	31.57	61.40.11
Feb. 2	pallido	185109 181091	61.37.16 61. 5.32	61.38.56 61. 7.10	31.46	61.23. 3
Feb. 3	claro	182884 178942	61.19.50 60.48. 6	61.21.29 60.49.45	31.44	61. 5.37
Feb. 9	claro	169661 166150	59.29. 4 58.57.28	59.30.36 58.58.58	31.38	59.14.47

1723		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Feb. 12	Sole claro. Obſ. Parma cum Banderio	163244 159947	58.30.33 57.59.10	58.32. 1 58. 0.38	31.23	58.16.19
Feb. 19	Sole claro. Banderius	148796 145852	56. 5.48 55.33.52	56. 7. 7 55.35. 9	31.58	55.51. 8
Feb. 20	Sole claro	146802 143920	55.44.17 55.12.26	55.45.35 55.13.42	31.53	55.29.38
Mar. 19	Sole claro	101447 99587	45.24.41 44.52.52	45.25.34 44.53.44	31.50	45. 9.39
Mar. 20	cælo nubilo. Ego cum Banderio	100059 98233	45. 1. 1 44.29.22	45. 1.53 44.30.13	31.40	44.46. 3
Mar. 21	Cælo nub. cum Banderio	98686 96887	44.37.17 44. 5.40	44.38. 8 44. 6.31	31.37	44.22.19
Mar. 22	Sole claro Banderius	97341 95554	44.13.41 43.41.51	44.14.32 43.42.41	31.51	43.58.36
Mar. 23	clariſſimo	96009 94246	43.50. 1 43.18.12	43.50.52 43.19. 2	31.50	43.35.57
Mar. 25	claro, cælo nubilo	93403 91687	43. 2.48 42.31. 1	43. 3.37 42.31.49	31.48	42.47.43
Mar. 26	clariſſimo	92119 90438	42.39. 4 42. 7.33	42.39.52 42. 8.21	31.31	42.24. 6
Mar. 27	clariſſ. Parma cum Banderio	90866 89209	42.15.37 41.44. 9	42.16.25 41.44.57	31.28	42. 0.41
Mar. 29	claro. Idem	88416 86799	41.28.55 40.57.28	41.29.42 40.58.14	31.28	41.14.58
Mar. 30	claro. Banderius	87221 85616	41. 5.44 40.34. 9	41. 6.30 40.34.54	31.36	40.50.42
Mar. 31	claro. Banderius	86031 84441	40.42.21 40.10.42	40.43. 6 40.11.26	31.40	40.27.16
Apr. 1	cælo nubilo. Idem deinceps	84859 83292	40.19. 4 39.47.30	40.19.48 39.48.14	31.34	40. 4. 1

Apr.

1723		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Apr. 2	cælo nubilo	83720 82165	39.56.10 39.24.29	39.56.54 39.25.12	31.42	39.41. 3
Apr. 8	cælo claro	77169 75728	37.39.26 37. 8. 9	37.40. 6 37. 8.48	31.18	37.24.27
Apr. 9	Sole languidiſſimo	76123 74720	37.16.47 36.46. 2	37.17.26 36.46.40	30.46	37. 2. 3
Apr. 12	cælo ſubnubilo	73130 71739	36.10.41 35.39.19	36.11.18 35.39.55	31.23	35.55.36
Apr. 13	Sole claro	72166 70780	35.49. 0 35.17.28	35.49.36 35.18. 4	31.32	35.33.50
Apr. 15	claro	70264 68907	35. 5.36 34.34.11	35. 6.11 34.34.46	31.25	34.50.28
Apr. 17	languido	68426 67098	34.22.57 33.51.40	34.23.32 33.52.14	31.18	34. 7.53
Apr. 21	claro	64929 63639	32.59.44 32.28.21	33. 0.18 32.28.53	31.45	32.44.15
Apr. 23	claro	63269 61995	32.19.17 31.47.50	32.19.49 31.48.21	31.28	32. 4. 5
Apr. 26	inter nubes	60906 59650	31.20.39 30.48.58	31.21. 9 30.49.28	31.41	31. 5.18
Apr. 27	languidiſſimo	60114 58891	31. 0.43 30.29.40	31. 1.13 30.30.10	31. 3	30.45.41
Apr. 29	claro	58622 57407	30.22.48 29.51.32	30.23.18 29.52. 2	31.16	30. 7.40
Apr. 30	Sole claro	57901 56688	30. 4.17 29.32.55	30. 4.46 29.33.23	31.23	29.49. 5
Maj. 1	Sole claro	57185 55989	29.45.49 29.14.40	29.46.17 29.15. 6	31.11	29.30.41
Maj. 3	Sole claro, cælo nubilo ſpecie tremula	55810 54617	29. 9.58 28.38.32	29.10.26 28.38.59	31.27	28.54.42

Maj.

1723		Tangentes correctæ a penumbra	Dist. a vertice apparens limborum	Dist. a vertice vera limborum	Diam. app. Solis	Dist. a vertice vera centri
			G ' ''	G ' ''	' ''	G ' ''
Maj. 5	clariſſimo	54477 53309	28.34.49 28. 3.43	28.35.16 28. 4. 9	31. 7	28.19.42
Maj. 6	clariſſimo	53830 52670	28.17.40 27.46.35	28.18. 7 27.47. 0	31. 7	28. 2.33
Maj. 10	Sole nubilo	51403 50261	27.12.17 26.41. 6	27.12.42 26.41.30	31.12	26.57. 6
Maj. 11	claro	50832 49696	26.56.44 26.25.34	26.57. 9 26.25.58	31.11	26.41.33
Maj. 18	claro	47185 46079	25.15.38 24.44.24	25.16. 1 24.44.47	31.14	25. 0.24
Maj. 20	claro	46261 45165	24.49.33 24.18.22	24.49.55 24.18.44	31.11	24.34.19
Maj. 21	cælo nubilo	45818 44730	24.36.59 24. 5.56	24.37.21 24. 6.18	31. 3	24.21.49
Jun. 4	Sole pallido	41077 40028	22.19.55 21.48.56	22.20.15 21.49.16	30.59	22. 4.46
Jun. 5	claro, cælo nubilo	40839 39790	22.12.43 21.41.53	22.13. 3 21.42.13	30.50	21.57.38
Jun. 15	Sole claro, cælo nubilo	39230 38183	21.25.13 20.53.55	21.25.33 20.54.14	31.19	21. 9.54
Jun. 16	ut antea	39147 38104	21.22.44 20.51.33	21.23. 4 20.51.52	31.12	21. 7.28
Jun. 17	Sole claro	39073 38032	21.20.33 20.49.22	21.20.52 20.49.41	31.11	21. 5.16
Jun. 19	Sole claro	38968 37930	21.17.24 20.46.18	21.17.43 20.46.37	31. 6	21. 2.10
Jun. 20	clariſſimo. Tangentes notatæ in ipſa regula ferrea	38944 37902	21.16.42 20.45.27	21.17. 1 20.45.46	31.15	21. 1.23
Jun. 21	claro in regula ferrea	38922 37889	21.16. 1 20.45. 4	21.16.20 20.45.23	30.57	21. 0.52

Jun.

1723		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jun. 22	clariſſimo in regula ferrea	38923 37887	21.16. 3 20.45. 1	21.16.22 20.45.20	31. 2	21. 0.51
Jun. 23	pallido in regula ferrea	38930 37901	21.16.16 20.45.25	21.16.35 20.45.44	30.51	21. 1.10
Jun. 27	pallido	39113 38081	21.21.44 20.50.51	21.22. 4 20.51.10	30.54	21. 6.37
Jun. 28	claro	39198 38158	21.24.15 20.53.10	21.24.35 20.53.30	31. 5	21. 9. 2
Jul. 2	claro	39657 38616	21.37.54 21. 6.52	21.38.14 21. 7.11	31. 3	21.22.42
Jul. 3	ſubpallido	39810 38768	21.42.27 21.11.26	21.42.47 21.11.45	31. 2	21.27.16
Jul. 6	Sole claro	40337 39289	21.58. 4 21.26.58	21.58.24 21.27.18	31. 6	21.42.51
Jul. 8	claro	40758 39709	22.10.30 21.39.28	22.10.50 21.39.48	31. 2	21.55.19
Jul. 10	Sole claro	41234 40183	22.24.30 21.53.33	22.24.50 21.53.53	30.57	22. 9.21
Jul. 11	ut ſupra	41491 40438	22.32.21 22. 1. 4	22.32.41 22. 1.24	31.17	22.17. 2
Jul. 23	Sole claro	45637 44547	24.31.52 24. 0.43	24.32.14 24. 1. 5	31. 9	24.16.39
Jul. 27	ut ſupra	47454 46344	25.23.12 24.51.55	25.23.35 24.52.18	31.17	25. 7.57
Jul. 28	claro ſpecie tremula	47942 46830	25.36.52 25. 5.50	25.37.15 25. 6.13	31. 2	25.21.44
Jul. 29	Sole claro	48430 47314	25.50.29 25.19.16	25.50.53 25.19.39	31.14	25.35.16
Jul. 30	ut ſupra	48952 47835	26. 4.58 25.33.52	26. 5.22 25.34.15	31. 7	25.49.49

Aug.

1723		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 6	ut ſupra	52910 51744	27.53. 0 27.21.33	27.53.26 27.21.58	31.28	27.37.42
Aug. 12	ut ſupra	56812 55617	29.36. 8 29. 4.54	29.37.36 29. 5.22	32.14	29.21.29
Aug. 14	ut ſupra	58224 57010	30.12.36 29.41.16	30.13. 5 29.41.44	31.21	29.57.24
Aug. 15	ut ſupra	58950 57730	30.31.19 29.59.53	30.31 49 30. 0.22	31.21	30.16. 2
Aug. 18	ut ſupra	61209 59966	31.28.14 30.56.58	31.28.45 30.57.28	31.17	31.13. 6
Sept. 5	Sole clariſſimo	77447 75998	37.45.25 37.14. 4	37.46. 6 37.14.43	31.23	37.30.24
Sept. 12	Sole pallido	85090 83528	40.23.41 39.52.18	40.24.26 39.53. 2	31.24	40. 8.44
Sept. 16	ut ſupra	89814 88180	41.55.43 41.24.22	41.56.31 41.25. 9	31.22	41.40.50
Sept. 21	ut ſupra	96129 94384	43.52.21 43.20.43	43.53.12 43.21.32	31.40	43.37.22
Sept. 23	Sole claro	98806 97020	44.39.22 44. 7.59	44.40.13 44. 8.50	31.23	44.24.31
Sept. 24	ut ſupra	100170 98330	45. 2.56 44.31. 4	45. 3.48 44.31.55	31.53	44.47.51
Sept. 25	ut ſupra	101549 99684	45.26.26 44.54.34	46.27.19 44.55.26	31.47	45.11.19
Oct. 23	Sole pallido	148450 145510	56. 2. 5 55.30. 7	56. 3.24 55.31.24	32. 0	55.47.24
Nov. 7	Sole ſubpallido	180035 176158	60.57. 0 60.25. 3	60.58.38 60.26.39	31.59	60.42.39
Nov. 8	ut ſupra	182234 178286	61.14.40 60.42.44	61.16.19 60.44.21	31.58	61. 0.20

Dec.

1723		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Dec. 24	Sole claro	249747 243120	68.10.43 67.38.30	68.13. 0 67.40.44	32.16	67.56.52
1724						
Jan. 26	Sole claro cælo ſubnubilo Banderius	201230 196635	63.34.32 63. 2.39	63.36.21 63. 4.26	31.55	63.20.23
Jan. 27	Sole claro	199054 194497	63.19.34 62.47.26	63.21.21 62.49.12	32. 9	63. 5.16
Mar. 20	Sole inter nubes Banderius	99013 97207	44.42.58 44.11.19	44.43.49 44.12.10	31.39	44.27.59
Maj. 13	Sole claro. Ego	49322 48205	26.15.13 25.44.12	26.15.37 25.44.35	31. 2	26. 0. 6
Maj. 20	Sole claro. Banderius	45927 44831	24.40. 5 24. 8.50	24.40.28 24. 9.12	31.16	24.24.50
Jun. 19	Sole cla. Ego cum Parma, Joſ. Marcheſio, & Dominico VVeber in ipſa regula ferrea	38950 37910	21.16.49 20.45.39	21.17. 8 20.45.58	31.10	21. 1.33
Jun. 21	Sole lang. Ego cum Parma, in ipſa regula ferrea	38920 37885	21.15.58 20.44.58	21.16.17 20.45.17	31. 0	21. 0.47
Jun. 22	Sole claro, ſpecie trem. Parma, & VVeber in reg. ferrea	38927 37888	21.16.11 20.45. 4	21.16.30 20.45.23	31. 7	21. 0.56
Jul. 11	Parma	41689 40652	22.37.51 22. 7.23	22.38.11 22. 7.43	30.28	22.22.57
Jul. 14		42583 41518	23. 3.58 22.32.51	23. 4.19 22.33.11	31. 8	22.48.45
Jul. 22		45541 44454	24.29. 4 23.58. 2	24.29.26 23.58.24	31. 2	24.13.55
Jul. 24		46417 45316	24.53.58 24.22.42	24.54.21 24.23. 4	31.17	24.38.42

1724		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jul. 25		46855 45746	25. 6.20 24.34.56	25. 6.42 24.35.18	31.25	24.51. 0
Jul. 26		47332 46229	25.19.46 24.48.39	25.20. 9 24.49. 1	31. 8	25. 4.35
Jul. 27		47812 46717	25.33.12 25. 2.26	25.33.35 25. 2.49	30.46	25.18.12
Jul. 29		48819 47707	26. 1.17 25.30.17	26. 1.41 25.30.40	31. 1	25.46.10
Aug. 1		50439 49300	26.45.58 26.14.37	26.46.22 26.15. 0	31.22	26.30.41
Aug. 2		50990 49847	27. 1. 2 26.29.42	27. 1.27 26.30. 6	31.21	26.45.46
Aug. 3	Imago obſcura	51566 50420	27.16.42 26.45.27	27.17. 7 26.45.51	31.16	27. 1.29
Aug. 4		52146 50993	27.32.26 27. 1. 7	27.32.51 27. 1.32	31.19	27.17.11
Aug. 5		52758 51507	27.48.55 27.17.33	27.49.21 27.17.58	31.23	27.33. 9
Aug. 6		53370 52206	28. 5.21 27.34. 4	28. 5.47 27.34.29	31.18	27.50. 8
Aug. 10		55950 54754	29.13.38 28.42. 9	29.14. 5 28.42.35	31.30	28.58.20
Aug. 12		57320 56112	29.49.17 29.17.52	29.49.45 29.18.19	31.26	29.34. 2
Aug. 13		58034 56828	30. 7.43 29.36.32	30. 8.12 29.37. 0	31.12	29.52.36
Aug. 14		58758 57548	30.26.16 29.55.13	30.26.46 29.55.42	31. 4	30.11.14
Aug. 16		60249 59022	31. 4. 8 30.33. 0	31. 4.38 30.33.30	31. 8	30.49. 4

Aug.

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1724			G ′ ″	G ′ ″	′ ″	G ′ ″
Aug. 18		61802 60537	31.43. 2 31.11.23	31.43.33 31.11.53	31.40	31.27.43
Aug. 19		62582 61308	32. 2.22 31.30.42	32. 2.54 31.31.13	31.41	31.47. 3
Aug. 23		65896 64583	33.23. 0 32.51.20	33.23.34 32.51.53	31.41	33. 7.43
Aug. 24		66756 65446	33.43.31 33.12.12	33.44. 5 33.12.45	31.20	33.28.25
Aug. 26		68522 67183	34.25.11 33.53.40	34.25.45 33.54.14	31.31	34. 9.59
Aug. 28		70345 68982	35. 7.29 34.35.56	35. 8. 4 34.36.31	31.33	34.52.17
Sept. 8		81455 79932	39. 9.54 38.38.10	39.10.37 38.38.52	31.45	38.54.44
Sept. 21	Banderius. Dubia obſervatio	97141 95388	44.10. 9 43.38.52	44.11. 0 43.39.43	31.17	43.55.21
Sept. 22	Banderius. Sole pallidiſs.	98483 96707	44.33.44 44. 2.28	44.34.35 44. 3.19	31.16	44.18.57
Sept. 23	Banderius. Sole pallido	99830 98037	44.57.26 44.25.56	44.58.18 44.26.37	31.41	44.42.27
Dec. 18	Banderius. Dubia	249533 243129	68. 9.42 67.38.33	68.11.59 67.40.47	31.12	67.56.23
1725						
Mar. 10	Banderius	14056 111952	48.45.25 48.13.39	48.46.25 48.14.37	31.48	48.30.31
Mar. 21	Parma, ac Bander. Sole claro	97984 96188	44.25. 0 43.53.13	44.25.51 43.54. 4	31.47	44. 9.57
Jun. 21	iidem. Sole pallidiſſ. dubia	38912 37886	21.15.44 20.45. 0	21.16. 3 20.45.19	30.44	21. 0.41

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1725			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 22	iidem ☼ claro	38917 37870	21.15.52 20.44.31	21.16.11 20.44.50	31.21	21. 0.30
Jun. 25	iidem ☼ ſubpallido	39016 37989	21.18.50 20.48. 6	21.19. 9 20.48.25	30.44	21. 4.47
Dec. 14	Marcheſius, Parma, Banderius	247298 240840	67.58.59 67.27. 4	68. 1.15 67.29.16	31.59	67.45.15
Dec. 17	iidem ☼ languido	249052 242470	68. 7.25 67.35.16	68. 9.41 67.37.28	32.13	67.53.34
Dec. 19	iidem	249465 242943	68. 9.23 67.37.37	68.11.39 67.39.49	31.50	67.55.44
Dec. 21	Parma, Marcheſ. Banderius	249998 243346	68.11.55 67.39.38	68.14.12 67.41.52	32.20	67.58. 2
Dec. 24	iidem	249657 243107	68.10.17 67.38.26	68.12.34 67.40.40	31.54	67.56.37
1726						
Mar. 21	Parma, & Marcheſius	98314 96503	44.30.47 43.58.50	44.31.39 43.59.41	31.58	44.15.40
Mar. 22	iidem	96964 95179	44. 7. 1 43.35. 6	44. 7.52 43.35.56	31.56	43.51.54
Mar. 23	Marcheſius, & Parma	95628 93905	43.43.11 43.11.59	43.44. 1 43.12.48	31.13	43.28.25
Mar. 29	iidem	89304 87734	41.45.58 41.15.43	41.46.46 41.16.29	30.17	41.31.37
Jun. 8	Parma	43176 42124	23.21.11 22.50.36	23.21.32 22.50.56	30.36	23. 6.14
Jun. 11	idem	39627 38640	21.37.11 21. 7.37	21.37.31 21. 7.56	29.35	21.22.43
Jun. 17	idem	39035 38010	21.19.24 20.48.44	21.19.53 20.49. 3	30.50	21. 4.28

Jun.

1726		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 19		38950 37907	21.16.52 20.45.37	21.17.12 20.46.56	31.16	21. 2.34
Jun. 20		38911 37915	21.15.42 20.45.55	21.16. 1 20.46.14	29.47	21. 1. 7
Jun. 21		38902 37883	21.15.26 20.44.54	21.15.45 20.45.13	30.32	21. 0.29
Jun. 23		38928 37884	21.16.13 20.44.56	21.16.32 20.45.15	31.17	21. 0.53
Jun. 25		39037 37962	21.19.28 20.47.17	21.19.47 20.47.36	32.11	21. 3.41
Jun. 26		39062 38015	21.20.13 20.48.52	21.20.32 20.49.11	31.21	21. 4.51
Jun. 29		39318 38271	21.27.51 20.56.33	21.28.10 20.56.52	31.18	21.12.31
Jun. 30		39414 38360	21.30.42 20.59.12	21.31. 1 20.59.31	31.40	21.15.21
Jul. 1		39697 38638	21.39. 6 21. 7.35	21.39.26 21. 7.54	31.32	21.23.40
Jul. 3		39848 38806	21.43.36 21.12.35	21.43.55 21.12.54	31. 1	21.28.25
Jul. 5		40207 39142	21.54.15 21.22.35	21.54.35 21.22.54	31.41	21.38.44
Aug. 25	Ego cum Franciſco Blanchino, qui Bononiæ ad aliquot dies ſuit	67203 65879	33.54. 9 33.22.36	33.54.43 33.23. 9	31.34	33.38.56
Aug. 27	ego cum eodem	68987 67651	34.36. 2 34. 4.45	34.36.37 34. 5.19	31.18	34.20.58
Aug. 31	Parma	72730 71340	36. 1.45 35.30.15	36. 2.22 35.30.51	31.31	35.46.36

Sept.

1726		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 2	idem	74686 73253	36.45.18 36.13.27	36.45.57 36.14. 4	31.53	36.30. 0
Sept. 8	idem	80919 79415	38.58.47 38.27.18	38.59.30 38.27.59	31.31	38.43.44
Sept. 9	Blanchinus	82025 80510	39.21.37 38.50.15	39.22.20 38.50.58	31.22	39. 6.39
Sept. 12	Parma	85402 83820	40.29.55 39.58.12	40.30.40 39.58.57	31.43	40.14.48
Sept. 20	Parma	95203 93452	43.35.33 43. 3.42	43.36.23 43. 4.31	31.52	43.20.27
Sept. 21	idem	96520 94741	43.59. 9 43.27.12	44. 0. 0 43.28. 1	31.59	43.44. 0
Sept. 22	idem	97856 96035	44.22.46 43.50.29	44.23.37 43.51.20	32.17	44. 7.28
Sept. 24		100553 98720	45. 9.29 44.37.52	45.10.21 44.38.43	31.38	44.54.32
Sept. 26		103345 101472	45.56.33 45.25. 7	45.57.27 45.25.59	31.28	45.41.43
Dec. 9		242319 236135	67.34.30 67. 2.53	67.36.42 67. 5. 2	31.40	67.20.52
Dec. 10		243452 237188	67.40. 9 67. 8.22	67.42.22 67.10.31	31.51	67.26.26
1727						
Jan. 17	Parma	219696 214457	65.31.34 65. 0. 3	65.33.34 65. 2. 0	31.34	65.17.47
Mar. 6		121216 119087	50.28.42 49.58.46	50.29.46 49.59.49	29.57	50.14.47
Mar. 11		113244 111168	48.33.15 48. 1.39	48.34.14 48. 2.37	31.37	48.18.25

Mar.

1727		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Mar. 13	ſpecie ſquallida	110343 108263	47.48.55 47.16.20	47.49.52 47.17.16	32.36	47.33.34
Mar. 15		107164 105221	46.58.51 46.27.27	46.59.47 46.28.22	31.25	46.44. 4
Mar. 17		104242 102354	46.11.24 45.40. 0	46.12.18 45.40.53	31.25	45.56.35
Mar. 18		102799 100958	45.47.27 45.16.23	45.48.20 45.17.15	31. 5	45.32.47
Mar. 21		98629 96852	44.36.17 44. 5. 2	44.37. 9 44. 5.52	31.16	44.21.31
Mar. 25		93364 91633	43. 2. 4 42.30. 0	43. 2.53 42.30.48	32. 5	42.46.50
Mar. 29		88367 86759	41.27.59 40.56.42	41.28.46 40.57.28	31.22	41.13. 9
Maj. 3		55779 54586	29. 9. 9 28.37.43	29. 9.36 28.38.10	31.26	28.53.53
Maj. 7		53182 52013	28. 0.19 27.28.51	28. 0.45 27.29.16	31.29	27.45. 1
Maj. 9		51967 50814	27.27.36 26.56.13	27.28. 1 26.56.38	31.23	27.12.19
Maj. 10	In alia ſchedula Parmæ hujuſce obſervationis numeri tribus particulis majores notabantur	51385 50251	27.11.47 26.40.49	27.12.12 26.41.14	30.58	26.56.43
Maj. 13		49702 48573	26.25.43 25.54.22	26.26. 7 25.54.46	31.21	26.10.26
Maj. 14		49169 48050	26.11. 0 25.39.52	26.11.24 25.40.15	31. 9	25.55.49
Maj. 16		48138 47017	25.42.20 25.10.55	25.42.44 25.11.18	31.26	25.27. 1

1727		Tangentes correctæ ape numbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 17		47639 46533	25.28.22 24.57.15	25.28.45 24.57.38	31. 7	25.13.11
Maj. 21		45802 44705	24.36.33 24. 5.14	24.36.55 24. 5.36	31.19	24.21.15
Maj. 23		44968 43871	24.12.46 23.41.15	24.13. 8 23.41.36	31.32	23.57.24
Jun. 11		39705 38652	21.39.21 21. 7.58	21.39.41 21. 8.17	31.24	21.23.59
Jun. 12		39562 38512	21.35. 6 21. 3.47	21.35.26 21. 4. 6	31.20	21.19.46
Jun. 14		39323 38268	21.28. 0 20.56.28	21.28.20 20.56.57	31.23	21.12.38
Jun. 15		39216 38188	21.24.48 20.54. 4	21.25. 8 20.54.23	30.45	21. 9.46
Jun. 16		39144 38093	21.22.39 20.51.13	21.22.59 20.51.32	31.27	21. 7.15
Jun. 17		39061 38034	21.20.11 20.49.27	21.20.31 20.49.46	30.45	21. 5. 9
Jun. 18		39018 37961	21.18.55 20.47.15	21.19.15 20.47.34	31.41	21.3. 24
Jun. 21		38918 37887	21.15.57 20.45. 2	21.16.17 20.45.21	30.56	21. 0.49
Jun. 22		38918 37874	21.15.57 20.44.38	21.16.17 20.44.57	31.20	21. 0.37
Jun. 23		38922 37901	21.16. 2 20.45.27	21.16.22 20.45.46	30.36	21. 1. 4
Jun. 24		38966 37907	21.17.22 20.45.38	21.17.42 20.45.57	31.45	21. 1.49
Jun. 26		39052 38005	21.19.54 20.48.35	21.20.14 20.48.54	31.20	21. 4.34

1727		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 27		39119 38078	21.21.57 20.50.46	21.22.17 20.51. 5	31.12	21. 6.41
Sept. 15	Obſervante Franc. Vandellio	88637 87050	41.33.10 41. 2.23	41.33.57 41. 3. 9	30.48	41.18.33
Sept. 20	Parma	94892 93165	43.29.56 42.58.36	43.30.46 42.59.25	31.21	43.15. 5
Sept. 21		96197 94436	43.53.22 43.21.39	43.54.13 43.22.29	31.44	43.38.21
Sept. 22		97519 95739	44.16.49 43.45.11	44.17.40 43.46. 2	31.38	44. 1.51
Sept. 24		100282 98401	45. 4.51 44.32.18	45. 5.43 44.33. 9	32.34	44.49.26
1728						
Jan. 4	Parma	241591 235493	67.30.51 66.59.32	67.33. 3 67. 1.41	31.22	67.17.22
Jan. 15		224057 218586	65.56.53 65.25. 0	65.58.56 65.27. 0	31.56	65.42.58
Mar. 17		103154 101275	45.53.23 45.21.35	45.54.17 45.22.28	31.49	45.38.23
Mar. 18		101731 99856	45.29.30 44.57.33	45.30.22 44.58.25	31.57	45.14.23
Apr. 3		81705 80168	39.15. 3 38.43. 6	39.15.46 38.43.48	31.58	38.59.47
Apr. 4		80585 79090	38.51.50 38.20.26	38.52.33 38.21. 8	31.25	38.36.50
Apr. 7		77399 75920	37.44.23 37.12.21	37.45. 3 37.13. 0	32. 3	37.29. 1
Apr. 9		75337 73898	36.59.37 36.27.49	37. 0.16 36.28.27	31.49	36.44.22

1728		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 11		73337 71943	36.15.19 35.43.57	36.15.56 35.44.33	31.23	36. 0.15
Apr. 12		72374 70979	35.53.42 35.22. 0	35.54.19 35.22.36	31.43	35.38.28
Apr. 14		70466 69085	35.10.15 34.38.20	35.10.50 34.38.55	31.55	34.54.52
Apr. 16		68620 67270	34.27.29 33.55.44	24.28. 4 33.56.18	31.46	34.12.11
Apr. 19		65965 64619	33.24.39 32.52.13	33.25.13 32.52.47	32.26	33. 9. 0
Apr. 20		65105 63789	33. 3.57 32.32. 0	33. 4.30 32.32.32	31.58	32.48.31
Jun. 15		39160 38097	21.23. 7 20.51.20	21.23.27 20.51.39	31.48	21. 7.33
Jun. 18		38980 37939	21.17.46 20.46.35	21.18. 6 20.46.54	31.12	21. 2.30
Jun. 20		38923 37882	21.16. 4 20.44.53	21.16.23 20.45.12	31.11	21. 0.47
Jun. 24		38975 37937	21.17.36 20.46.31	21.17.55 20.46.50	31. 5	21. 2.22
Jul. 5		40304 39239	21.57. 6 21.25.29	21.57.26 21.25.50	31.36	21.41.38
Sept. 20		95892 94155	43.47.56 43.16.33	43.48.45 43.17.22	31.23	43.33. 4
Sept. 25		102652 100782	45.45. 0 45.13.24	45.45.53 45.14.16	31.37	45.30. 4
Dec. 21		250045 243373	68.12. 8 67.39.46	68.14.25 67.42. 0	32.25	67.58.12
Dec. 28		247615 241106	68. 0.31 67.28.25	68. 2.47 67.30.37	32.10	67.46.42

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1729			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 5	Parma	54119 52957	28.25.19 27.54.16	28.25.46 27.54.42	31. 4	28.10.14
Maj. 12		49971 48861	26.33. 7 26. 2.27	26.33.31 26. 2.51	31.40	26.18.41
Maj. 23		44755 43680	24. 6.39 23.35.44	24. 7. 1 23.36. 5	30.56	23.52. 3
Jun. 15		39194 38166	21.24. 9 20.53.25	21.24.29 20.53.44	30.45	21. 9. 6
Jun. 20		38907 37881	21.15.36 20.44.51	21.15.55 20.45.10	30.45	21. 0.32
Jun. 21		38932 37875	21.16.22 20.44.40	21.16.41 20.44.59	31.42	21. 0.50
Jun. 22		38926 37890	21.16. 9 20.45. 8	21.16.28 20.45.27	31. 1	21. 0.58
Jun. 24		38971 37932	21.17.30 20.46.23	21.17.49 20.46.42	31. 7	21. 2.15
Jun. 29		39244 38200	21.25.37 20.54.26	21.25.57 20.54.45	31.12	21.10.21
Aug. 31		73006 71604	36. 7.56 35.36.15	36. 8.33 35.36.51	31.42	35.52.42
Sept. 1		73978 72553	36.29.36 35.57.44	36.30.14 35.58.21	31.53	36.14.17
Dec. 19	ad hunc enim diem pertinet obſervatio, licet notata d. 18	249743 243129	68.10.42 67.38.33	68.12.59 67.40.46	32.13	67.56.52
1730						
Jun. 18	Parma	39003 37955	21.18.27 20.47. 4	21.18.46 20.47.23	31.23	21. 3. 4
Jun. 20		38924 37890	21.16. 5 20.45. 7	21.16.24 20.45.26	30.58	21. 0.55

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1730			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 22		38924 37879	21.16. 5 20.44.47	21.16.24 20.45. 6	31.18	21. 0.45
Jun. 26		39077 38022	21.20.39 20.49. 6	21.20.59 20.49.25	31.34	21. 5.12
Jun. 27		39143 38102	21.22.37 20.51.29	21.22.57 20.51.48	31. 9	21. 7.22
Jul. 4		40024 38981	21.48.49 21.17.47	21.49. 9 21.18. 7	31. 2	21.33.38
Sept. 23	Obſerv. Gabriele fratre ☼ clariſſimo	99229 97435	44.46.42 44.15.21	44.47.33 44.16.12	31.21	44.31.52
1731						
Mar. 18	ex hac die obſervationes habere cæpit Joſ. Roverſius	102751 100889	45.46.39 45.15.13	45.47.33 45.16. 5	31.28	45.31.49
Mar. 20		99938 98140	44.58.57 44.27.45	44.59.49 44.28.36	31.13	44.44.12
Mar. 21		98583 96801	44.35.29 44. 4. 8	44.36.20 44. 4.59	31.21	44.20.39
Mar. 22		97247 95469	44.12. 2 43.40.20	44.12.53 43.41.10	31.43	43.57. 1
Mar. 23		95907 94155	43.48.12 43.16.33	43.49. 3 43.17.22	31.41	43.33.12
Mar. 24		94600 92862	43.24.38 42.52.50	43.25.27 42.53.39	31.48	43. 9.33
Mar. 28		89538 87900	41.50.27 41.18.57	41.51.15 41.19.44	31.31	41.35.29
Apr. 2		83611 82084	39.53.58 39.22.50	39.54.42 39.23.33	31. 9	39.39. 7
Apr. 7		78125 76684	37.59.56 37.28.57	38. 0.37 37.29.37	31. 0	37.45. 7

1731		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Apr. 25	Roverſius	61587 60355	31.37.41 31. 6.48	31.38.12 31. 7.18	30.54	31.22.45
Jun. 16		39135 38095	21.22.23 20.51.17	21.22.43 20.51.36	31. 7	21. 7. 9
Jun. 18		39009 37975	21.18.38 20.47.40	21.18.57 20.47.59	30.58	21. 3.28
Jun. 19		38956 37928	21.17. 4 20.46.15	21.17.24 20.46.34	30.50	21. 1.59
Jun. 20		38933 37912	21.16.22 20.45.47	21.16.41 20.46. 6	30.35	21. 1.23
Jun. 21		38925 37893	21.16. 8 20.45.11	21.16.27 20.45.30	30.57	21. 0.58
Jun. 22		38913 37892	21.15.46 20.45.11	21.16. 5 20.45.30	30.35	21. 0.47
Jun. 23		38928 37909	21.16.13 20.45.42	21.16.32 20.46. 1	30.31	21. 1.16
Jun. 24		38961 37921	21.17.11 20.46. 3	21.17.30 20.46.22	31. 8	21. 1.56
Jun. 25		38998 37960	21.18.18 20.47.13	21.18.37 20.47.32	31. 5	21. 3. 4
Jul. 3		39817 38770	21.42.40 21.11.29	21.42.59 21.11.48	31.11	21.27.23
Jul. 10		41256 40210	22.25. 9 21.54.20	22.25.29 21.54.40	30.49	22.10. 4
Jul. 16		43010 41952	23.16.21 22.45.34	23.16.42 22.45.55	30.47	23. 1.18
Jul. 30	Sole clariſſimo	48982 47867	26. 5.48 25.34.45	26. 6.12 25.35. 8	31. 4	25.50.40
Aug. 25		67011 65710	33.49.36 33.18.32	33.50.10 33.19. 6	31. 4	33.34.38

Sept.

1731		Tangentes correctę a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 17		91120 89470	42.20.24 41.49. 9	42.21.12 41.49.57	31.15	42. 5.34
Sept. 18		92379 90701	42.43.53 42.12.31	42.44.42 42.13.19	31.23	42.29. 0
Sept. 19		93643 91946	43. 7.11 42.35.51	43. 8. 0 42.36.39	31.21	42.52.19
Sept. 20		94930 93197	43.30.37 42.59. 0	43.31.27 42.59.49	31.38	43.15.38
Sept. 21	Julius Accetta Auguſtinianus in Taurinenſi gymnaſio mathematicus Regius, cum Gabriele fratre	96248 94473	43.54.17 43.22.20	43.55. 8 43.23.10	31.58	43.39. 8
Sept. 22	Roverſius	97558 95787	44.17.31 43.46. 2	44.18.22 43.46.53	31.29	44. 2.39
Sept. 23		98896 97100	44.40.56 44. 9.26	44.41.48 44.10.17	31.31	44.26. 2
Sept. 24		100264 98434	45. 4.33 44.32.52	45. 5.25 44.33.43	31.42	44.49.34
Sept. 25		101637 99790	45.27.55 44.56.23	45.28.48 44.57.15	31.33	45.13. 1
Sept. 26		103042 101170	45.51.31 45.20. 0	45.52.25 45.20.52	31.33	45.36.38
Sept. 27		104466 102566	46.15. 5 45.43.33	46.15.59 45.44.27	31.32	46. 0.13
Dec. 23		249868 243227	68.11.17 67.39. 2	68.13.34 67.41.15	32.19	67.57.25
Dec. 24		249708 243068	68.10.34 67.38.15	68.12.51 67.40.28	32.23	67.56.39
Dec. 25		249466 242812	68. 9.23 67.36.58	68.11.39 67.39.12	32.27	67.55.26

Dec.

1731		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 26		249073 242440	68. 7.30 67.35. 7	68. 9.46 67.37.19	32.27	67.53.33
Dec. 27		248587 241999	68. 5.12 67.32.52	68. 7.28 67.35. 4	32.24	67.51.16
Dec. 28		248019 241480	68. 2.28 67.30.18	68. 4.44 67.32.30	32.14	67.48.37
Dec. 29		247361 240844	67.59.18 67.27. 6	68. 1.34 67.29.18	32.16	67.45.26
1732						
Jan. 8	Roverſius	236076 230040	67. 2.34 66.30.18	67. 4.43 66.32.24	32.19	66.48.34
Jan. 9		234530 228525	66.54.27 66.21.59	66.56.36 66.24. 4	32.32	66.40.20
Jan. 10		232895 227033	66.45.42 66.13.42	66.47.50 66.15.46	32. 4	66.31.48
Jan. 12		229495 223749	66.27.20 65.55. 7	66.29.26 65.57.10	32.16	65.13.18
Mar. 18		101692 99825	45.28.50 44.57. 0	45.29.43 44.57.51	31.52	45.13.47
Mar. 21		97585 95783	44.18. 0 43.45.59	44.18.51 43.46.49	32. 2	44. 2.50
Mar. 24		93597 91911	43. 6.21 42.35.11	43. 7.10 42.35.59	31.11	42.51.34
Mar. 26		91077 89396	42.19.35 41.47.44	42.20.23 41.48.31	31.52	42. 4.27
Jun. 14		39244 38199	21.25.38 20.54.24	21.25.58 20.55.43	30.15	21.10.50
Jun. 18		38971 37949	21.17.29 20.46.53	21.17.48 20.47.12	30.36	21. 2.30

Jun.

1732		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 20		38926 37897	21.16. 9 20.45.20	21.16.28 20.45.39	30.59	21. 1. 9
Jun. 21		38916 37893	21.15.46 20.45.13	21.16. 5 20.45.32	30.33	21. 0.48
Jun. 25		39042 38004	21.19.36 20.48.33	21.19.55 20.48.52	31. 3	21. 4.23
Jun. 30		39493 38470	21.33. 3 21. 2.31	21.33.23 21. 2.50	30.33	21.18. 6
Jul. 5		39945 38901	21.46.28 21.15.24	21.46.48 21.15.43	31. 5	21.31.15
Sept. 21		97231 95466	44.11.45 43.40.17	44.12.36 43.41. 7	31.29	43.56.52
Sept. 22		98573 96775	44.35.18 44. 3.40	44.36. 9 44. 4.31	31.38	44.20.20
Sept. 23		99924 98110	44.58.41 44.27.13	44.59.33 44.28. 4	31.29	44.43.49
Sept. 26		104101 102234	46. 9. 4 45.37.59	46. 9.58 45.38.52	31. 6	45.54.25
Sept. 27		105557 103623	46.32.55 46. 1.10	46.33.50 46. 2. 4	31.46	46.17.57
Dec. 21		249924 243283	68.11.33 67.39.19	68.13.50 67.41.32	32.18	67.57.41
Dec. 22		249882 243203	68.11.21 67.38.55	68.13.38 67.41. 8	32.30	67.57.23
Dec. 23		249730 243107	68.10.40 67.38.26	68.12.57 67.40.39	32.18	67.56.48
1733						
Mar. 16	Roverſius	104879 102960	46.21.51 45.50. 8	46.22.46 45.51. 2	31.44	46. 6.54

Mar.

1733		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Mar. 31		85331 83755	40.28.29 39.56.53	40.29.14 39.57.37	31.37	40.13.25
Jun. 21		38918 37891	21.15.54 20.45. 9	21.16.13 20.45.28	30.45	21. 0.50
Jun. 22		38925 37897	21.16. 8 20.45.20	21.16.27 20.45.39	30.48	21. 1. 3
Jun. 24		38972 37952	21.17.31 20.46.58	21.17.50 20.47.17	30.33	21. 2.33
Jun. 26		39079 38058	21.20.45 20.50.10	21.21. 4 20.50.29	30.35	21. 5.47
Sept. 15	clariſſimo	89308 87674	41.46. 3 41.14.21	41.46.51 41.15. 7	31.44	41.30.59
Sept. 16	clariſſimo	90521 88876	42. 9. 7 41.37.46	42. 9.55 41.38.33	31.22	41.54.14
Sept. 17	clariſſimo	91760 90093	42.32.23 42. 1. 0	42.33.11 42. 1.48	31.23	42.17.29
Sept. 18	clariſſimo	93023 91330	42.55.48 42.24.21	42.56.37 42.25. 9	31.28	42.40.53
Sept. 19	clariſſimo	94285 92582	43.18.55 42.47.39	43.19.45 42.48.29	31.16	43. 4. 7
Sept. 22	claro	98243 96450	44.29.33 43.57.54	44.30.24 43.58.45	31.39	44.14.35
Sept. 24	claro	100957 99123	45.16.23 44.44.52	45.17.15 44.45.44	31.31	45. 1.29
Sept. 25	clariſſimo	102342 100487	45.39.48 45. 8.22	45.40.41 45. 9.14	31.27	45.24.58
Sept. 26	clariſſimo	103750 101873	46. 3.16 45.31.54	46. 4.10 45.32.47	31.23	45.48.29

1733		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Oct. 13	*Specie clara, & maxime tremula*. Obſervabat hodie, & deinceps ad diem 7 Aprilis 1734 Andreas Celſius Regiæ ſcientiarum Upſalienſis Academiæ a ſecretis, atque Aſtronomiæ Profeſſor Regius. Ex ejus autographo humaniſſime mihi tradito obſervationes totidem verbis deſcripſi, correctis tantum a penumbra tangentium numeris	130818 128370	52.36.18 52. 4.54	52.37.27 52. 6. 2	31.25	52.21.44
Oct. 15	*ſpecie clara, & ſatis tremula*	134400 131845	53.20.57 52.49.16	53.22. 8 52.50.25	31.43	53. 6.16
Oct. 16	*ſpecie ut ſupra*	136236 133656	53.43.14 53.11.48	53.44.25 53.12.58	31.27	53.28.42
Oct. 21	*ut ſupra*	145630 142844	55.31.26 55. 0.20	55.32.43 55. 1.35	31. 8	55.17. 9
Oct. 22	*ſpecie non ſatis clara, ſed ſatis tremula*	147591 144718	55.52.50 55.21.21	55.54. 9 55.22.38	31.31	55.38.23
Oct. 28	*ſpecie ſatis clara, ſed parum tremula dub.*	159808 156573	57.57.50 57.26. 4	57.59.16 57.27.28	31.48	57.43.22
Oct. 29	*ſpecie clara, & ſatis tremula*	161874 158615	58.17.43 57.46.14	58.19.10 57.47.39	31.31	58. 3.24
Nov. 3	*ſpecie clariſ. & max. tremula*	172494 168896	59.53.52 59.22.16	59.55.26 59.23.48	31.38	59.39.37
Nov. 4	*ut ſupra*	174682 170977	60.12.37 59.40.40	60.14.12 59.42.13	31.59	59.58.13
Nov. 8	*ſpecie clara, & ſatis tremula*	183500 179530	61.24.41 60.52.55	61.26.21 60.54.32	31.49	61.10.27
Nov. 10	*ſpecie ut ſupra*	187920 183808	61.58.51 61.27. 7	62. 0.34 61.28.47	31.47	61.44.40

Nov.

1733		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Nov. 11	ſpecie clariſ. & max. tremula	190130 185965	62.15.28 61.43.54	62.17.12 61.45.35	31.37	62. 1.23
Nov. 12	ſpecie ut ſupra	192338 188070	62.31.46 61.59.59	62.33.31 62. 1.42	31.49	62.17.37
Nov. 14	ſpecie clariſ. & max. tremula	196755 192346	63. 3.30 62.31.49	63. 5.17 62.33.34	31.43	62.49.25
Nov. 15	ſpecie clara, & max. tremula	198960 194480	63.18.55 62.47.18	63.20.43 62.49. 4	31.39	63. 4.54
Nov. 18	ſpecie clariſ. & max. tremula	205520 200770	64. 3.14 63.31.23	64. 5. 5 63.33.12	31.53	63.49. 8
Nov. 19	ut ſupra	207642 202824	64.17. 5 63.45.18	64.18.58 63.47. 8	31.50	64. 3. 3
Nov. 20	ut ſupra	209786 204895	64.30.50 63.59. 6	64.32.44 64. 0.57	31.47	64.15.50
Nov. 21	ut ſupra	211907 206930	64.44.14 64.12.28	64.46. 9 64.14.20	31.49	64.30.15
Nov. 24	ſpecie ſat. clara, & parum trem.	218050 212873	65.21.48 64.50.15	65.23.46 64.52.11	31.35	65. 7.59
Nov. 26	ſpecie clariſ. & max. tremula	222012 216638	65.45. 7 65.13.19	65.47. 9 65.15.17	31.52	65.31.13
Nov. 27	ſpecie clariſ. & ſatis tremula	223942 218477	65.56.14 65.24.21	65.58.17 65.26.20	31.57	65.42.18
Nov. 28	ſpecie non ſat. cl. & parũ trem.	225843 220265	66. 7. 1 65.34.55	66. 9. 5 65.36.55	32.10	65.53. 0
Nov. 29	ſpecie clara, & ſatis tremula	227648 222030	66.17. 7 65.45.14	66.19.12 65.47.16	31.56	66. 3.14
Dec. 2	ut ſupra	232844 227020	66.45.29 66.13.38	66.47.36 66.15.42	31.54	66.31.39
Dec. 9	ſpecie non ſatis clara, & parum tremula dub.	242615 236405	67.35.59 67. 4.18	67.38.11 67. 6.27	31.44	67.22.19

1733		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Dec. 20	ſpecie ut ſupra cum Roverſio	249833 243197	68.11. 8 67.38.53	68.13.25 67.41. 7	32.18	67.57.16
Dec. 21	ſpecie clariſſima, & maxime tremula cum eodem	249920 243315	68.11.32 67.39.28	68.13.50 67.41.41	32. 9	67.57.45
Dec. 23	ſpecie clara, & ſatis tremula	249784 243165	68.10.53 67. 8.44	68.13.11 67.40.57	32.14	67.57. 4
Dec. 29	ſpecie pallida, & parum trem.	246994 240486	67.57.31 67.25.16	67.59.47 67.27.27	32.20	67.43.37
1734						
Jan. 6	ſpecie cl. & ſat. trem. cum Rov.	238218 232163	67.13.42 66.41.49	67.15.52 66.43.56	31.56	66.59.54
Jan. 10	ſpecie ut ſupra	232020 226206	66.41. 3 66. 9. 4	66.43.10 66.11. 8	32. 2	66.27. 9
Jan. 12	ſpecie clariſ. & max. trem.	228555 222875	66.22. 9 65.50. 7	66.24.14 65.52. 9	32. 5	66. 8.11
Jan. 14	ut ſupra	224897 219340	66. 1.45 65.29.29	66. 3.48 65.31.29	32.19	65.47.38
Jan. 24	ut ſupra dub.	204305 199608	63.55.12 63.23.24	63.57. 3 63.25.12	31.51	63.41. 8
Jan. 25	ſpecie clara, & ſatis tremula	202103 197475	63.40.28 63. 8.34	63.42.18 63.10.21	31.57	63.26.19
Jan. 26	ut ſupra	199920 195375	63.25.33 62.53.42	63.27.21 62.55.26	31.55	63.11.23
Jan. 27	ſpecie pallidiſſima, & parum tremula dub.	197662 193250	63. 9.53 62.38.24	63.11.40 62.40. 9	31.31	62.55.55
Jan. 28	ſpecie clara, & ſatis tremula	195460 191110	62.54.18 62.22.44	62.56. 5 62.24.29	31.36	62.40.17
Jan. 29	ſpecie clara, & ſatis tremula cum Roverſio	193255 188956	62.38.27 62. 6.40	62.40.12 62. 8.23	31.49	62.24.21

1734		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 30	ſpecie clariſ. & max. trem.	191024 186798	62.22. 6 61 50.18	62.23.50 61.52. 0	31.50	62. 7.55
Jan. 31	ut ſupra	188798 184674	62. 5.29 61.33.53	62. 7.12 61.35.33	31.39	61.51.23
Feb. 1	ſpecie clariſ. & ſatis trem.	186565 182500	61.48.31 61.16.47	61.50.13 61.18.26	31.47	61.34.20
Feb. 5	ſpecie ſubpallida, & parum tremula dub.	177708 173884	60.37.58 60. 5.49	60.39.34 60. 7.23	32.11	60.23.28
Feb. 8	ſpecie clariſ. & maxime trem.	171048 167510	59.41.17 59. 9.50	59.42.50 59.11.20	31.30	59.27. 5
Feb. 9	ut ſupra	168902 165395	59.22.19 58.50.33	59.23.50 58.52. 2	31.48	59. 7.56
Feb. 10	ſpecie clara, & ſatis tremula	166754 163350	59. 2.58 58.31.34	59. 4.28 58.33. 2	31.26	58.48.55
Feb. 11	nt ſupra	164635 161320	58.43.32 58.12.21	58.45. 1 58.13.48	31.1[illegible]	58.29.25
Feb. 12	ſpecie clariſ. & maxime trem.	162529 159260	58.23.50 57.52.31	58.25.17 57.53.56	31.21	58. 9.37
Feb. 13	ut ſupra	160465 157200	58. 4.10 57.32.18	58. 5.36 57.33.42	31.54	57.49.39
Feb. 15	ut ſupra	156274 153127	57.23. 5 56.51.12	57.24.28 56.52.33	31.55	57. 8.30
Feb. 16	ſpecie clara, & ſatis tremula cum Gabr. Manfredio	154197 151087	57. 2. 9 56.30. 2	57. 3.31 56.31.22	32. 9	56.47.26
Feb. 17	ut ſupra cum Roverſio	152169 149123	56.41.19 56. 9.17	56.42.40 56.10.36	32. 4	56.26.38
	Nocte ſeq. ſpecie Lunæ pallidiſſima, & vix tremula Tangentes limborum Lunæ 78281, 76828					

1734		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 18	ſpecie clara, & ſatis tremula	150115 147151	56.19.49 55.48. 4	56.21. 8 55.49.22	31.46	56. 5.15
Feb. 19	ſpecie clara, & maxime trem.	148120 145202	55.58.33 55.26.42	55.59.52 55.27.59	31.53	55.43.55
Feb. 20	ſpecie clara, & ſatis trem.	146128 143287	55.36.54 55. 5.20	55.38.11 55. 6.35	31.36	55.22.23
Feb. 21	ſpecie clariſſ. & max. trem.	144185 141420	55.15.24 54.44. 8	55.16.40 54.45.22	31.18	55. 1. 1
Feb. 22	ſpecie ut ſupra	142267 139563	54.53.48 54.22.40	54.55. 3 54.23.52	31.11	54.39.28
Feb. 23	ſpecie clara, & ſatis trem. dub.	140373 137707	54.32. 4 54. 0.49	54.33.17 54. 2. 1	31.16	54.17.39
Feb. 24	Sole clariſ. & ſpecie max. trem.	138500 135866	54.10.12 53.38.47	54.11.24 53.39.58	31.26	53.55.41
Feb. 25	ut ſupra cum Roverſio	136642 134035	53.48. 7 53.16.28	53.49.18 53.17.38	31.40	53.33.28
Feb. 26	ſpecie pallida, & parum trem.	134779 132226	53.25.35 52.54. 2	53.26.46 52.55.12	31.34	53.10.59
Feb. 27	ſpecie ſat. clara, & max. trem.	132977 130445	53. 3.24 52.31.34	53. 4.34 52.32.43	31.51	52.48.38
Mar. 1	ſpecie clara, & ſatis tremula	129373 126950	52.17.49 51.46.20	52.18.57 51.47.26	31.31	52. 3.12
Mar. 2	ſpecie ſubpallida, & ſat. trem.	127596 125247	51.54.48 51.23.44	51.55.56 51.24.50	31. 6	51.40.23
Mar. 3	ſpecie clariſſ. & maxime trem.	125890 123550	51.32.18 51. 0.49	51.33.24 51. 1.54	31.30	51.17.39
Mar. 4	ut ſupra	124163 121851	51. 9.11 50.37.31	51.10.16 50.38.35	31.40	50.54.25
Mar. 5	ſpecie cl. & ſat. trem. cum Rov.	122475 120183	50.46. 7 50.14.19	50.47.11 50.15.22	31.49	50.31.16

Mar.

1734		Tangentes correctæ apenumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Mar. 6	Tenuis nubes mediam quaſi ſpeciem Solis ſecabat, & ideo margo alter pallidus, & parum tremulus, alter vero ſpeciei margo clarus, & ſatis tremulus	120804 118571	50.22.57 49.51.24	50.24. 0 49.52.27	31.33	50. 8.13
Mar. 11	ſpecie clara, & ſatis tremula	112761 110714	48.27.57 47.54.39	48.26.56 47.55.37	31.19	48.11.17
Mar. 13	ſpecie clariſſ. & max. trem.	109593 107583	47.37.12 42. 5.32	47.38. 9 47. 6.26	31.43	47.22.17
Mar. 17	ut ſupra cum Roverſio	103798 101909	46. 4. 4 45.32.30	46. 4.58 45.33.23	31.35	45.49.11
Mar. 18	ſpecie clara, & ſatis trem. dub.	102386 100506	45.40.32 45. 8.42	45.41.25 45. 9.34	31.51	45.25.29
Mar. 21	ſpecie clara, & parum trem. cum Euſtachio Zanotto	98229 96438	44.29.29 43.57.41	44.30.20 43.58.32	31.48	44.14.26
Mar. 24	ſpecie ſubpallida, & par. trem.	94242 92537	43.18. 8 42.46.38	43.18.57 42.47.26	31.31	43. 3.12
Mar. 25	ſpecie pallidiſ. & parum trem.	92934 91278	42.54.10 42.23.21	42.54.59 42.24. 9	30.50	42.39.34
Mar. 28	ſpecie pallida, & parum trem. cum Roverſio	89210 87599	41.44.11 41.13. 6	41.44.58 41.13.52	31. 6	41.29.25
Mar. 29	ſpecie ſubpall. & parum trem.	87993 86396	41.20.45 40.49.33	41.21.32 40.50.18	31.14	41. 5.55
Mar. 31	ſpecie clariſſ. & ſatis trem.	85621 84056	40.34.14 40. 2.58	40.34.59 40. 3.42	31.17	40.19.21
Apr. 2	ſpecie clariſſ. & ſatis trem.	83323 81784	39.48. 8 39.16.41	39.48.51 39.17.24	31.27	39.33. 8
Apr. 3	ſpecie clara, & ſatis trem. cum Roverſio	82192 80673	39.25. 4 38.53.40	39.25.47 38.54.23	31.24	39.10. 5

Apr.

1734		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 4	*ſpecie clariſſ. & ſatis trem.*	81092 79583	39. 2.22 38.30.50	39. 3. 5 38.31.32	31.33	38.47.18
Apr. 5	*ſpecie clara, & ſatis tremula*	79988 78513	38.39.22 38. 8. 9	38.40. 4 38. 8.50	31.14	38.24.27
Apr. 6	*ſpecie pallida, & parum trem.*	78915 77483	38.16.44 37.45.33	38.17.25 37.46.13	31.12	38. 1.49
Apr. 7	*ut ſupra*	77844 76423	37.53.56 37.23.18	37.54.37 37.23.58	30.39	37.39.18
Apr. 8	Obſervante iterum Roverſio hodie, & deinceps. Sole claro	76812 75365	37.31.43 37. 0.13	37.32.23 37. 0.52	31.31	37.16.37
Apr. 9	Sole pallido	75769 74369	37. 9. 3 36.38.16	37. 9.42 36.38.54	30.48	36.54.18
Apr. 11	Sole ſubpallido	73782 72372	36.25.14 35.53.38	36.25.52 35.54.15	31.37	36.10. 3
Apr. 12	Sole clariſſimo	72795 81400	36. 3.10 35.31.37	36. 3.47 35.32.13	31.34	35.48. 0
Apr. 13	Sole claro	71821 70450	35.41.11 35. 9.52	35.41.48 35.10.27	31.21	35.26. 7
Apr. 14	Sole clariſſimo	70880 69518	35.19.45 34.48.22	35.20.20 34.48.57	31.23	35. 4.38
Apr. 15	Sole clariſſimo	69945 68591	34.58.15 34.26.49	34.58.50 34.27.24	31.26	34.43. 7
Apr. 16	Sole pallido	69016 67696	34.36.43 34. 5.47	34.37.18 34. 6.21	30.57	34.21.50
Apr. 17	Sole claro	68127 66796	34.15.56 33.44.29	34.16.30 33.45. 3	31.27	34. 0.46
Apr. 18	Sole pallido	67218 65908	33.54.30 33.23.17	33.55. 4 33.23.51	31.13	33.39.28
Apr. 19	Sole pallidiſſimo	66339 65044	33.33.36 33. 2.31	33.34.10 33. 3. 4	31. 6	33.18.37

Apr.

1734		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 23	Sole pallidiſſimo	62978 61728	32.12. 7 31.41.10	32.12.39 31.41.41	30.58	31.57.10
Maj. 14	Sole claro	49009 47894	26. 6.33 25.35.31	26. 6.57 25.35.54	31. 3	25.51.25
Maj. 15	pallidiſſimo	48452 47387	25.51. 5 25.21.18	25.51.29 25.21.41	29.48	25.36.35
Maj. 18	Sole claro	47024 45918	25.11. 5 24.39.50	25.11.28 24.40.13	31.15	24.55.50
Maj. 20	Sole clariſſimo	46113 45012	24.45.22 24.14. 1	24.45.45 24.14.23	31.22	24.30. 4
Maj. 21	Sole pallido	45667 44593	24.32.41 24. 2. 1	24.33. 3 24. 2.23	30.40	24.17.43
Maj. 26	Sole claro	43698 42626	23.36.15 23. 5.12	23.36.36 23. 5.33	31. 3	23.21. 4
Maj. 29	Sole ſubpallido	42674 41618	23. 6.35 22.35.46	23. 6.56 22.36. 6	30.50	22.51.31
Jun. 1	Sole clariſſimo	41776 40715	22.40.24 22. 9.14	22.40.44 22. 9.34	31.10	22.25. 9
Jun. 2	Sole claro	41506 40449	22.32.30 22. 1.23	22.32.50 22. 1.43	31. 7	22.17.16
Jun. 4	Sole clariſſimo	40997 39956	22.17.33 21.46 47	22.17.53 21.47. 7	30.46	22. 2.30
Jun. 5	Sole clariſſimo	40760 39722	22.10.34 21.39.53	22.10.54 21.40.13	30.41	21.55.34
Jun. 7	Sole clariſſimo	40341 39298	21.58.11 21.27.15	21.58.31 21.27.35	30.56	21.43. 3
Jun. 8	Sole ſubpallido	40154 39111	21.52.40 21.21.40	21.53.10 21.22. 0	31.10	21.37.35
Jun. 10	Sole clariſſimo	39810 38769	21.42.26 21.11.27	21.42.46 21.11.46	31. 0	21.27.16

1734		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 11	Sole clariſſimo	39658 38625	21.37.57 21. 7. 9	21.38.17 21. 7.28	30.49	21.22.53
Jun. 13		39396 38357	21.30. 9 20.59. 8	21.30.29 20.59.27	31. 2	21.14.58
Jun. 14	Sole clariſſimo	39292 38257	21.27. 4 20.56. 7	21.27.24 20.56.26	30.58	21.11.55
Jun. 15	Sole clariſſimo	39202 38166	21.24.24 20.53.24	21.24.44 20.53.43	31. 1	21. 9.13
Jun. 16	Sole pallidiſſimo	39042 38108	21.19.36 20.51.40	21.19.55 20.51.59	27.56	
Jun. 17	Sole ſubpallido	39052 38025	21.19.55 20.49.10	21.20.14 20.49.29	30.45	21. 4.52
Jun. 21	Sole clariſſimo	38931 37887	21.16.18 20.45. 1	21.16.37 20.45.20	31.17	21. 0.58
Jun. 22	Sole clariſſimo	38927 37890	21.16.11 20.45. 7	21.16.30 20.45.26	31. 4	21. 0.58
Jun. 23	Sole clariſſimo	38941 37905	21.16.37 20.45.33	21.16.56 20.45.52	31. 4	21. 1.24
Jun. 24	Sole clariſſimo	38975 37944	21.17.36 20.46.43	21.17.55 20.47. 2	30.53	21. 2.29
Jun. 25	Sole clariſſimo	39012 37996	21.18.44 20.48.18	21.19. 3 22.48.37	30.26	21. 3.50
Jun. 26	Sole clariſſimo	39066 38038	21.20.20 20.49.34	21.20.39 20.49.53	30.46	21. 5.16
Jun. 28	Sole clariſſimo	39225 38193	21.25. 4 20.54.13	21.25.23 20.54.32	30.51	21. 9.57
Jun. 30	Sole pallido	39428 38414	21.31. 7 21. 0.51	21.31.27 21. 1.10	30.17	21.16.19
Jul. 3	Sole clariſſimo	39863 38827	21.44. 2 21.13.11	21.44.22 21.13.30	30.52	21.28.56

Jul.

1734		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jul. 8	Sole clariſſimo	40837 39795	22.12.49 21.42. 1	22.13. 9 21.42.21	30.48	21.57.45
Jul. 9	Sole clariſſimo	41078 40026	22.19.57 21.48.51	22.20.17 21.49.11	31. 6	22. 4.44
Jul. 10	Sole clariſſimo	41328 40281	22.27.16 21.56.25	22.27.36 21.56.45	30.51	22.12.10
Aug. 26	inter nubes	68030 66836	34.13.39 33.45.26	34.14.13 33.46. 0	28.13	
Aug. 27	Sole clariſſimo	69047 67713	34.37.27 34. 6.11	34.38. 2 34. 6.45	31.17	34.22.23
Aug. 28	Sole clariſſimo	69965 68612	34.58.41 34.27.19	34.59.16 34.27.54	31.22	34.43.35
Aug. 31	Sole clariſſimo	72784 71399	36. 2.56 35.31.35	36. 3.33 35.32.11	31.22	35.47.52
Sept. 1	Sole clariſſimo	73761 72363	36.24.47 35.53.27	36.25.24 35.54. 4	31.20	36. 9.44
Sept. 2	Sole clariſſimo	74739 73337	36.46.27 36.15.19	36.47. 6 36.15.56	31.10	36.31.31
Sept. 3	Sole clariſſimo	75744 74327	37. 8.30 36.37.21	37. 9. 9 36.37.59	31.10	36.53.34
Sept. 4	Sole clariſſimo	76761 75328	37.30.38 36.59.24	37.31.18 37. 0. [illegible]	31.15	37.15.40
Sept. 6	Sole clariſſimo	78842 77379	38.15.12 37.43.58	38.15.53 37.44.38	31.15	38. 0.15
Sept. 7		79869 78432	38.36.56 38. 6.28	38.37.33 38. 7. 9	30.24	38.22.21
Sept. 12	obſervavit Euſtach. Zanottus	85475 83905	40.31.21 39.59.58	40.32. 6 40. 0.42	31.24	40.16.24
Sept. 17	Sole claro. Iterum Roverſius	91457 89801	42.26.43 41.55.28	42.27.31 41.56.16	31.15	42.11.53

1734		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 18	Sole clariſſimo	92711 91027	42.50. 2 42.18.39	42.50.51 42.19.27	31.24	42.35. 9
Sept. 19	Sole clariſſimo	93986 92275	43.13.28 42.41.58	43.14.17 42.42.46	31.31	42.58.31
Sept. 20	Sole clariſſimo	95277 93539	43.36.52 43. 5.17	43.37.42 43. 6. 6	31.36	43.21.54
Nov. 5	Sole claro	176349 172568	60.26.40 59.54.31	60.28.16 59.56. 5	32.11	60.12.10
Nov. 7	Sole claro	180768 176863	61. 2.56 60.30.57	61. 4.34 60.32.33	32. 1	60.48.33
Nov. 8	Sole pallido	182943 179001	61.20.18 60.48.35	61.21.57 60.50.12	31.45	61. 6. 5
Nov. 9	Sole clariſ. obſervavit Zanot.	185177 181137	61.37.48 61. 5.54	61.39.29 61. 7.32	31.57	61.23.30
Nov. 10	Sole clariſ. iterum Roverſius	187368 183261	61.54.39 61.22.48	61.56.22 61.24.27	31.55	61.40.24
Nov. 11	Sole clariſſimo	189594 185404	62.11.28 61.39.33	62.13.12 61.41.14	31.58	61.57.13
Nov. 12	ut ſupra	191783 187537	62.27.41 61.55.56	62.29.26 61.57.39	31.47	62.13.33
Nov. 13	Sole claro	194000 189668	62.43.50 62.12. 0	62.45.36 62.13.44	31.52	62.29.40
Nov. 14	Sole clariſſimo	196197 191795	62.59.33 62.27.47	63. 1.20 62.29.32	31.48	62.45.26
Nov. 15	Sole ut ſupra	198433 193910	63.15.16 62.43.12	63.17. 4 62.44.58	32. 6	63. 1. 1
Nov. 16	Sole claro	200597 196029	63.30.12 62.58.21	63.32. 1 63. 0. 8	31.53	63.16. 4
Nov. 28	Sole clariſſimo	225353 219797	66. 4.15 65.32.10	66. 6.18 65.34.10	32. 8	65.50.14

Nov.

		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
1734			G ′ ″	G ′ ″	′ ″	G ′ ″
Nov. 29	Sole claro obſ. Zanottus	227146 221567	66.14.19 65.42.32	66.16.23 65.44.34	31.49	66. 0.29
Dec. 1	Iterum Roverſius. Sole claro	230855 224996	66.34.44 66. 2.14	66.36.50 66. 4.17	32.33	66.20.33
Dec. 2	Sole clariſſimo	232414 226595	66.43.10 66.11.15	66.45.17 66.13.19	31.58	66.29.18
Dec. 3	Sole pallidiſſimo. Incerta obſervatio	233876 227866	66.50.58 66.18.20	66.53. 6 66.20.25	32.41	66.36.45
Dec. 22	Sole claro	249939 243293	68.11.40 67.39.22	68.13.38 67.41.37	32.21	67.57.47
1735						
Jan. 13	Roverſius, cælo nubilo	227175 221559	66.14.29 65.42.29	66.16.33 65.44.31	32. 2	66. 0.32
Jan. 14	Sole claro	225346 219768	66. 4.13 65.32. 0	66. 6.16 65.34. 2	32.14	65.50. 9
Jan. 15	Sole clariſſimo	223415 217945	65.53.13 65.21.11	65.55.16 65.23.13	32. 3	65.39.14
Jan. 16	Sole clariſſimo	221475 216083	65.42. 0 65. 9.58	65.44. 0 65.11.56	32. 4	65.27.58
Jan. 17	Sole clariſſimo	219510 214210	65.30.28 64.58.31	65.32.28 65. 0.28	32. 0	65.16.28
Jan. 28	clariſſimo	195986 191603	62.58. 3 62.26.22	62.59.50 62.28. 7	31.53	62.44. 4
Jan. 29	clariſſimo	193790 189453	62.42.19 62.10.24	62.44. 3 62.12. 7	31.56	62.28. 5
Jan. 30	clariſſimo	191547 187308	62.25.57 61.54.12	62.27.42 61.55.55	31.47	62.11.49
Feb. 7		173799 170127	60. 5. 6 59.33.12	60. 6.40 59.34.44	31.56	59.50.42

Feb.

1735		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Feb. 9	Sole clariſſimo	169443 165916	59.27. 8 58.55.19	59.28.40 58.56.49	31.51	59.12.44
Feb. 10	Sole clariſſimo	167290 163833	59. 7.50 58.36. 4	59. 9.20 58.37.32	31.48	58.53.26
Feb. 11	Sole clariſſimo	165144 161796	58.48.14 58.16.53	58.49.43 58.18.20	31.23	58.34. 2
Feb. 12	ut ſupra	163045 159747	58.28.41 57.57.14	58.30. 9 57.58.40	31.29	58.14.25
Feb. 15	ut ſupra	156771 153600	57.28. 2 56.56. 3	57.29.26 56.57.25	32. 1	57.13.25
Mar. 18	clariſſimo	102719 100851	45.46. 7 45.14.35	45.47. 1 45.15.27	31.34	45.31.14
Mar. 23	inter nubes	95860 94116	43.47.21 43.15.50	43.48.12 43.16.39	31.33	43.17.26
Mar. 31	claro	85908 84316	40.39.56 40. 8.11	40.40.41 40. 8.55	31.46	40.24.48
Apr. 4	clariſſimo	81343 79837	39. 7.34 38.36.10	39. 8.17 38.36.52	31.25	38.52.34
Apr. 16	obſerv. Hercules Antonius Coſſinus S. Theol. Doct.	69236 67898	34.41.50 34.10.33	34.42.25 34.11. 7	31.18	34.26.46
Apr. 27	clariſſimo. Roverſius	60042 58802	30.58.54 30.27.23	30.59.24 30.27.53	31.31	30.43.38
Jun. 9	clariſſimo	40014 38972	21.48.30 21.17.31	21.48.50 21.17.51	30.59	21.33.21
Jun. 18	Sole clariſſimo. Roverſius	39015 37978	21.18.48 20.47.45	21.19. 8 20.48. 4	31. 4	21. 3.36
Jun. 21	clariſſimo	38921 37896	21.16. 0 20.45.16	21.16.20 20.45.35	30.45	21. 0.58
Jun. 22	claro obſ. Franc. Ab. Garampius Arimin. cum Roverſio	38915 37890	21.15.49 20.45. 6	21.16. 9 20.45.25	30.44	21. 0.47

Jun.

1735		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jun. 23	claro. Roverſius	38939 37908	21.16.33 20.45.38	21.16.53 20.45.57	30.56	21. 1.25
Jun. 25	clariſſimo	39002 37982	21.18.25 20.47.53	21.18.45 20.48.12	30.33	21. 3.28
Jun. 26	clariſſimo	39056 38020	21.20. 1 20.49. 0	21.20.21 20.49.20	31. 1	21. 4.50
	Quæ ſequuntur obſervationes operi jam abſoluto adjectæ ſunt					
Sept. 12	Sole claro. Deinceps obſervabat Pet. Ant. Serangelus Romanus Med. Doc. interdum cum Roverſio	85190 83634	40.25.40 39.54.26	40.26.25 39.55.10	31.15	40.10.47
Sept. 14	clariſſimo	87522 85925	41.11.35 40.40.16	41.12.21 40.41. 1	31.20	40.56.41
Sept. 15	clariſſimo	88710 87109	41.34.35 41. 3.32	41.35.22 41. 4.18	31. 4	41.19.50
Sept. 16	cælo nubilo	89920 88297	41.57.43 41.26.37	41.58.31 41.27.24	31. 7	41.42.57
Sept. 17	clariſſimo	91155 89514	42.21. 3 41.49.59	42.21.51 41.50.47	31. 4	42. 6.19
Sept. 19	cælo nubilo, ſpecie clara	93672 91973	43. 7.43 42.36.20	43. 8.32 42.37. 8	31.24	42.52.50
Sept. 20	ut ſupra	94927 93243	43.30.33 42.59.51	43.31.23 43. 0.40	30.43	43.16. 2
Sept. 22	ſpecie languidiſſima	97576 95830	44.17.49 43.46.48	44.18.40 43.47.39	31. 1	44. 3. 9
Sept. 23	ſpecie clara	98934 97142	44.41.36 44.10.10	44.42.28 44.11. 1	31.27	44.26.44
Sept. 24	clara	100293 98489	45. 5. 2 44.33.50	45. 5.54 44.34.41	31.13	44.50.17

1735		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Sept. 26	☼ nubilo dub. Serangelus	103020 101267	45.51. 8 45.21.39	45.52. 2 45.22.32	29.30	45.37.17
Sept. 29	ſpecie vividiſſima	107395 105461	47. 2.32 46.31.21	47. 3.28 46.32.16	31.12	46.47.52
Sept. 30	Sole claro	108890 106905	47.26.13 46.54.41	47.27.10 46.55.37	31.33	47.11.24
Oct. 1	nubilo	110394 108361	47.49.42 47.17.52	47.50.40 47.18.48	31.52	47.34.44
Oct. 2	vividiſſimo	111890 109883	48.12.42 47.41.46	48.13.40 47.42.43	30.57	47.58.11
Oct. 3	ut ſupra	113433 111371	48.36. 5 48. 4.46	48.37. 4 48. 5.44	31.20	48.21.24
Oct. 4	ut ſupra	114988 112887	48.59.17 48.27.51	49. 0.17 48.28.50	31.27	48.44.33
Oct. 5	cælo ſereno	116554 114441	49.22.17 48.51.10	49.23.18 48.52.13	31. 5	49. 7.45
Oct. 7	ſereno	119799 117584	50. 8.50 49.37.15	50. 9.53 49.38.17	31.36	49.54. 5
Oct. 10	Sole claro	124775 122443	51.17.24 50.45.40	51.18.29 50.46.44	31.45	51. 2.36
Oct. 15	Sole claro	133513 131005	53.10. 2 52.38.40	53.11.12 52.39.49	31.23	52.55.31
Oct. 16	ut ſupra	135344 132762	53.32.27 53. 0.43	53.33.38 53. 1.53	31.45	53.17.45
Oct. 17	nubilo	137172 134566	53.54.27 53.22.58	53.55.39 53.24. 9	31.30	53.39.54
Oct. 27		156710 153548	57.27.26 56.55.31	57.28.50 56.56.53	31.57	57.12.51
Oct. 28		158779 155567	57.47.49 57.16. 0	57.49.14 57.17.23	31.51	57.33.18

Oct.

1735		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Oct. 29	Serangelus	160883 157605	58. 8.10 57.36.18	58. 9.36 57.37.42	31.54	57.53.39
Oct. 31		165007 161667	58.46.58 58.15.40	58.48.27 58.17. 7	31.20	58.32.47
Nov. 1		167134 163708	59. 6.25 58.34.54	59. 7.55 58.36.22	31.33	58.52. 8
Nov. 2		169281 165766	59.25.42 58.53.57	59.27.14 58.55.27	31.47	59.11.20
Nov. 3	ſereno	171421 167840	59.44.33 59.12.48	59.46. 6 59.14.19	31.47	59.30.12
Nov. 4	ut ſupra	175596 169954	60. 3.22 59.31.38	60. 4.56 59.33.10	31.46	59.49. 3
Nov. 5	ut ſupra	175797 172054	60.22. 2 59.50. 4	60.23.37 59.51.37	32. 0	60. 7.37
Nov. 6	ut ſupra	178000 174183	60.40.22 60. 8.22	60.41.59 60. 9.56	32. 3	60.25.57
Nov. 7	ut ſupra	180192 176345	60.58.17 60.26.38	60.59.55 60.28.14	31.41	60.44. 4
Nov. 8	Sole pallido	182405 178502	61.16. 2 60.44.30	61.17.41 60.46. 7	31.34	61. 1.54
Nov. 9	ſereno	184611 180632	61.33.23 61. 1.50	61.35. 3 61. 3.28	31.35	61.19.15
Nov. 11		189033 184882	62. 7.15 61.35.30	62. 8.58 61.37.10	31.48	61.53. 4
Nov. 12	ſereno	191244 187007	62.23.43 61.51.54	62.25.27 61.53.36	31.51	62. 9.26
Nov. 15	Sole claro	197869 193371	63.11.19 62.39.17	63.13. 7 62.41. 3	32. 4	62.57. 5
Nov. 16	claro	200083 195524	63.26.40 62.54.46	63.28.29 62.56.33	31.56	63.12.31

		Tangentes correctæ a penumbra	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
1735			G ′ ″	G ′ ″	′ ″	G ′ ″
Nov. 17	ſereno Serangelus	202238 197647	63.41.21 63. 9.46	63.43.11 63.11.33	31.38	63.27.22
Nov. 21	ſpecie languida	210876 205938	64.37.45 64. 5.59	64.39.40 64. 7.50	31.50	64.23.45
Nov. 23	Sole claro	215035 209938	65. 3.35 64.31.49	65. 5.32 64.33.43	31.49	64.49.33
Nov. 26	cælo ſereno	221038 215698	65.39.24 65. 7.38	65.41.26 65. 9.36	31.50	65.25.31
Nov. 27	ut ſupra	223002 217546	65.50.23 65.18.47	65.52.26 65.20.45	31.41	65.36.35
Nov. 28	cælo ſereno	2248[illegible] 219349	[illegible] 65.29.32	66. [illegible].43 65.31.33	32.10	65.47.38
Nov. 29	ut ſupra	226773 221128	66.12.14 65.39.59	66.14.18 65.42. 1	32.17	65.58. 9
Dec. 11	Obſ. dubia, quod limbi infer. radius tecti imbricẽ ſtringeret	244329 237922	67.44.30 67.12.10	67.46.44 67.14.20	32.24	67.30.32
Dec. 14	ſereno, amoto imbrice	246975 240431	67.57.26 67.25. 0	67.59.42 67.27.12	32.30	67.43.27
Dec. 18	ſereno	249204 242596	68. 8. 8 67.35.53	68.10.25 67.38. 6	32.19	67.54.15
Dec. 19	ſereno	249523 242909	68. 9.11 67.37.28	68.11.28 67.39.42	31.46	67.55.35
Dec. 21	claro. Obſ. Thom. Perellus Floren. M. D. cum Serangelo, qui paullo poſt ex acuta febri diem obiit 30 Decembris	249888 243283	68.11.23 67.39.19	68.13.40 67.41.33	32. 7	67.57.37
1736						
Jan. 4	Obſ. Petrus Lilius Venetus J. U. D.	241429 235261	67.30. 5 66.58.18	67.32.17 67. 0.27	31.50	67.16.22

Jan.

1736		Tangentes correctæ apenumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Jan. 7	Lilius	237436 231415	67. 9.40 66.37.47	67.11.50 66.39.54	31.56	66.55.52
Jan. 8		235962 229971	67. 1.59 66.29.55	67. 4. 8 66.32. 1	32. 7	66.48. 4
Jan. 20		213870 208802	64.56.26 64.24.33	64.58.23 64.26.27	31.56	64.42.25
Jan. 21	claro	211778 206795	64.43.25 64.11.35	64.45.20 64.13.27	31.53	64.29.23
Jan. 22		209656 204750	64.30. 1 63.58. 9	64.31.55 64. 0. 0	31.55	64.15.57
Feb. 8		[illegible] 168530	59.50.44 59.19. 0	59.52.17 59.20.31	31.46	59.36.24
Feb. 13		161483 158323	58.13.54 57.43.22	58.15.21 57.44.47	30.34	58. 0. 4
Feb. 15	nubilo	157284 154096	57.33. 8 57. 1. 7	57.34.32 57. 2.29	32. 3	57.18.30
Feb. 19	claro	149104 146133	56. 9. 5 55.36.57	56.10.24 55.38.14	32.10	55.54.19
Feb. 25	claro	137527 134885	53.58.41 53.26.53	53.59.53 53.28. 4	31.49	53.43.59
Feb. 27	claro	133806 131278	53.13.38 52.42. 7	53.14.48 52.43.16	31.32	52.59. 2
Feb. 29	claro	130227 127779	52.28.47 51.57.12	52.29.56 51.58.20	31.36	52.14. 8
Mar. 1	claro	128477 126035	52. 6.17 51.34.14	52. 7.25 51.35.20	32. 5	51.51.22
Mar. 6	claro	119945 117713	50.10.54 49.39. 5	50.11.57 49.40. 7	31.50	49.56. 2
Mar. 10	Sole claro	113514 111421	48.37.18 48. 5.32	48.38.17 48. 6.30	31.47	48.22.23

1736		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Mar. 15	claro. Lilius	105932 104013	46.39. 0 46. 7.37	46.39.55 46. 8.31	31.24	46.24.13
Mar. 26	claro	91027 89366	42.18.39 41.47.11	42.19.27 41.47.58	31.29	42. 3.42
Mar. 27	claro	89790 88145	41.55.15 41.23.42	41.56. 3 41.24.29	31.34	41.40.16
Mar. 28	claro	88571 86944	41.31.55 41. 0.19	41.32.42 41. 1. 5	31.37	41.16.53
Mar. 30	claro	86180 84594	40.45.18 40.13.20	40.46. 3 40.14. 4	31.59	40.30. 4
Apr. 1	Paſchæ	83857 82306	39.58.40 39.27.12	39.59.23 39.27.55	31.28	39.43.39
Apr. 6	nubilo	78346 76921	38. 4.33 37.34.42	38. 5.14 37.35.22	29.52	37.50.18
Apr. 8	claro	76277 74837	37.20. 8 36.48.30	37.20.48 36.49. 8	31.40	37. 4.58
Apr. 9	claro	75248 73851	36.57.40 36.26.47	36.58.19 36.27.25	30.54	36.42.52
Apr. 13	claro	71340 69960	35.30.15 34.58.37	35.30.51 34.59.12	31.39	35.15. 1
Apr. 14	claro	70390 69024	35. 8.31 34.36.55	35. 9. 6 34.37.30	31.36	34.53.18
Apr. 17	claro	67649 66322	34. 4.44 33.33.12	34. 5.18 33.33.46	31.32	33.49.32
Apr. 18	nubilo	66753 65464	33.43.29 33.12.39	33.44. 3 33.13.12	30.51	33.28.38
Apr. 19	claro	65887 64597	33.22.48 32.51.41	33.23.22 32.52.14	31. 8	33. 7.48
Apr. 20	claro	65042 63750	33. 2.28 32.31. 3	33. 3. 1 32.31.35	31.26	32.47.18

Apr.

1736		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Apr. 21	claro	64193 62924	32.41.53 32.10.48	32.42.25 32.11.20	31. 5	32.27.52
Apr. 22	claro	63370 62105	32.21.46 31.50.33	32.22.18 31.51. 5	31.13	32. 7.41
Apr. 23	claro	62562 61303	32. 1.53 31.30.35	32. 2.25 31.31. 6	31.19	31.47.46
Apr. 24	nubilo	61744 60545	31.41.35 31.11.35	31.42. 6 31.12. 5	30. 1	31.27. 6
Apr. 25	nubilo	60976 59783	31.22.24 30.52.21	31.22.55 30.52.52	30. 3	31. 7.54
Apr. 27	nubilo	59437 58242	30.43.34 30.13. 4	30.44. 4 30.13.33	30.31	30.28.48
Maj. 1	claro	56585 55417	29.30.13 28.59.40	29.30.41 29. 0. 7	30.34	29.15.24
Maj. 5	Sole claro	53919 52765	28.20. 0 27.49. 6	28.20.26 27.49.31	30.55	28. 4.58
Maj. 7	claro	52672 51523	27.46.38 27.15.34	27.47. 4 27.15.59	31. 5	27.31.31
Maj. 8	claro	52071 50930	27.30.24 26.59.25	27.30.59 26.59.50	31. 9	27.15.24
Maj. 11	claro	50346 49220	26.43.25 26.12.24	26.43.50 26.12.48	31. 2	26.28.19
Maj. 12	claro	49799 48678	26.28.24 25.57.22	26.28.48 25.57.46	31. 2	26.13.17
Maj. 13	clariſſimo	49254 48149	26.13.20 25.42.39	26.13.44 25.43. 3	30.41	25.58.23
Maj. 14	clariſſimo	48750 47621	25.59.22 25.27.52	25.59.46 25.28.16	31.30	25.44. 1

Maj,

1736		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Maj. 16	pallido Lilius	47723 46635	25.30.44 25. 0. 9	25.31. 6 25. 0.32	30.34	25.15.49
Maj. 18	claro	46774 45685	25. 4. 4 24.33.12	25. 4.27 24.33.35	30.52	24.49. 1
Maj. 19	pallido	46322 45234	24.51.18 24.20.23	24.51.41 24.20.46	30.55	24.36.13
Maj. 20	pallido	45878 44794	24.38.42 24. 7.47	24.39. 5 24. 8. 9	30.56	24.23.37
Maj. 22	pallido	45021 43957	24.14.18 23.43.45	24.14.40 23.44. 7	30.33	23.59.23
Maj. 23	pallidiſſimo	44597 43559	24. 2. 9 23.32.16	24. 2.31 23.32.38	29.53	23.47.34
Maj. 24	claro	44244 43178	23.52. 0 23.21.15	23.52.22 23.21.37	30.45	23.36.59
Maj. 26	clariſſimo	43502 42446	23.30.38 22.59.58	23.31. 0 23. 0.19	30.41	23.15.40
Maj. 27	claro	43161 42096	23.20.45 22.49.46	23.21. 6 22.50. 7	30.59	23. 5.37
Maj. 28	clariſſimo	42831 41770	23.11.12 22.40.15	23.11.33 22.40.36	30.57	22.56. 5
Maj. 29	pallido	42512 41448	23. 1.53 22.30.48	23. 2.14 22.31. 8	31. 6	22.46.41
Maj. 30	claro	42195 41148	22.52.39 22.22. 1	22.52.59 22.22.21	30.38	22.37.40
Maj. 31	clariſſimo	41905 40850	22.44.11 22.13.13	22.44.32 22.13.33	30.59	22.29. 3
Jun. 1	clariſſimo	41627 40577	22.36. 4 22. 5.11	22.36.24 22. 5.31	30.53	22.20.57
Jun. 2	pallido	41361 40313	22.28.15 21.57.22	22.28.35 21.57.42	30.53	22.13. 8

1736		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 3	pallido	41105 40065	22.20.45 21.50. 0	22.21. 5 21.50.20	30.45	22. 5.42
Jun. 6	clariſſimo	40631 39618	22. 6.46 21.36.46	22. 7. 6 21.37. 6	30. 0	21.52. 6
Jun. 9	clariſſimo	39880 38849	21.44.33 21.13.52	21.44.53 21.14.12	30.41	21.29.32
Jun. 10	clariſſimo	39730 38689	21.40. 6 21. 9. 4	21.40.26 21. 9.24	31. 2	21.24.55
Jun. 12	clariſſimo	39450 38420	21.31.45 21. 1. 0	21.32. 5 21. 1.20	30.45	21.16.42
Jun. 13	clariſſimo	39337 38300	21.28.23 20.57.25	21.28.43 20.57.45	30.58	21.13.14
Jun. 14	clariſſimo	39231 38208	21.25.15 20.54.40	21.25.35 20.55. 0	30.35	21.10.17
Jun. 15	clariſſimo	39147 38110	21.22.32 20.51.42	21.22.52 20.52. 2	30.50	21. 7.27
Jun. 16	clariſſimo	39080 38041	21.20.46 20.49.39	21.21. 6 20.49.59	31. 7	21. 4.32
Jun. 17	pallidiſſimo	39009 37994	21.18.36 20.48.13	21.18.56 20.48.33	30.23	21. 3.44
Jun. 19	clariſſimo	38940 37904	21.16.35 20.45.15	21.16.55 20.45.35	31.20	21. 1.15
Jun. 20	clariſſimo	38922 37892	21.16. 0 20.45. 9	21.16.20 20.45.29	30.51	21. 0.55
Jun. 21	claro	38918 37897	21.15.54 20.45.18	21.16.14 20.45.38	30.36	21. 0.56
Jun. 22	clariſſimo	38940 37908	20.16.33 20.45.38	20.16.53 20.45.58	30.55	21. 1.25
Jun. 23	clariſſimo	38950 37917	21.16.50 20.45.55	21.17.10 20.46.15	30.55	21. 1.42

Jun.

1736		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum G ′ ″	Diſt. a vertice vera limborum G ′ ″	Diam. app. Solis ′ ″	Diſt. a vertice vera centri G ′ ″
Jun. 28	claro Lilius	39286 38246	21.26.53 20.55.50	21.27.13 20.56.10	31. 3	21.11.41
Jun. 29	clariſſimo	39379 38354	21.29.38 20.59. 2	21.29.58 20.59.22	30.36	21.14.40
Jun. 30	clariſſimo	39495 38471	21.33. 5 21. 2.33	21.33.25 21. 2.53	30.32	21.18. 9
Jul. 1	claro	39624 38604	21.36.56 21. 6.30	21.37.16 21. 6.50	30.26	21.22. 3
Jul. 2	clariſſimo	39784 38746	21.41.42 21.10.48	21.42. 2 21.11. 8	30.54	21.27.35
Jul. 3	pallido	39938 38917	21.46.16 21.15.53	21.46.36 21.16.13	30.23	21.31.25
Jul. 4	clariſſimo	40115 39082	21.51.31 21.20.50	21.51.51 21.21.10	30.41	21.36.30
Jul. 7	clariſſimo	40729 39687	22. 9.39 21.38.49	22.10. 0 21.39. 9	30.51	21.54.34
Jul. 8	clariſſimo	40958 39916	22.16.23 21.45.37	22.16.44 21.45.58	30.46	22. 1.21
Jul. 10	claro	41450 40405	22.30.51 22. 0. 6	22.31.12 22. 0.27	30.45	22.15.49
Jul. 11	pallido	41734 40674	22.39.11 22. 8. 1	22.39.33 22. 8.22	31.11	22.23.57
Jul. 14	claro	42622 41561	23. 5. 5 22.34. 5	23. 5.26 22.34.26	31. 0	22.49.56
Jul. 15	clariſſimo	42947 41874	23.14.32 22.43.16	23.14.53 22.43.37	31.16	22.59.15
Jul. 16	clariſſimo	43274 42217	23.24. 0 22.53.18	23.24.21 22.53.39	30.42	23. 8.50
Jul. 17	claro	43633 42564	23.34.23 23. 3.25	23.34.44 23. 3.46	30.58	23.19.15

Jul.

1736		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Jul. 18	clariſſimo	43993 42922	23.44.46 23.13.50	23.45. 8 23.14.11	30.57	23.29.39
Jul. 20	clariſſimo	44769 43689	24. 7. 4 23.36. 0	24. 7.26 23.36.22	31. 4	23.51.54
Jul. 23	clariſſimo	46014 44930	24.42.33 24.11.41	24.42.56 24.12. 3	30.53	24.27.29
Jul. 24	clariſſimo	46456 45372	24.55. 3 24.24.17	24.55.26 24.24.40	30.46	24.40. 3
Jul. 28	clariſſimo	48372 47261	25.48.52 25.17.46	25.49.16 25.18. 9	31. 7	25.33.42
Jul. 29	claro	48888 47779	26. 3.12 25.32.17	26. 3.36 25.32.41	30.55	25.48. 8
Jul. 30	claro	49406 48278	26.17.31 25.46.13	26.17.55 25.46.37	31.18	26. 2.16
Jul. 31	claro	49944 48817	26.32.23 26. 1.13	26.32.48 26. 1.37	31.11	26.17.12
Aug. 3	pallido	51620 50494	27.18.10 26.47.29	27.18.36 26.47.54	30.42	27. 3.15
Aug. 4	claro	52197 51080	27.33.49 27. 3.28	27.34.15 27. 3.53	30.22	27.19. 4
Aug. 13	clariſſimo	58110 56901	30. 9.40 29.38.26	30.10. 9 29.38.55	31.14	30. 4.32
Aug. 14	clariſſimo	58838 57629	30.28.19 29.57.17	30.28.48 29.57.46	31. 2	30.13.17
Aug. 15	clariſſimo	59577 58353	30.47. 8 30.15.54	30.47.38 30.16.23	31.15	30.32. 0
Aug. 16	claro	60339 59101	31. 6.18 30.35. 1	31. 6.48 30.35.31	31.17	30.51. 9
Aug. 17	clariſſimo	61099 59858	31.25.29 30.54.14	31.25.59 30.54.44	31.15	31.10.21

1736		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Aug. 25	clariſſimo Lilius	67712 66398	34. 6.10 33.35. 0	34. 6.44 33.35.33	31.11	33.51. 8
Aug. 29	pallido	71362 70010	35.30.45 34.59.46	35.31.21 35. 0.21	31. 0	35.15.51
Aug. 31	claro	73286 71888	36.14.11 35.42.42	36.14.48 35.43.18	31.30	35.59. 3
Sept. 4	pallidiſſimo	77266 75875	37.41.31 37.11.22	37.42.11 37.12. 1	30.10	37.27. 6
Sept. 12	clariſſimo, & tremulo	86077 84493	40.43.16 40.11.44	40.44. 1 40.12.29	31.32	40.28.15
Sept. 14	pallidiſſimo	88394 86855	41.28.20 40.58.34	41.29.17 40.59.20	29.57	41.14.18
Sept. 15	clariſſimo, & tremulo	89633 88018	41.52.16 41.21.14	41.53. 4 41.22. 1	31. 3	41.37.32
Sept. 16	ut ſupra	90843 89216	42.15.11 41.44.17	42.15.59 41.45. 4	30.55	42. 0.31
Sept. 17	pallido, & parum tremulo	92075 90448	42.38.15 42. 7.44	42.39. 4 42. 8.32	30.32	42.23.48
Sept. 18	clariſſimo, & tremulo	93349 91672	43. 1.43 42.30.44	43. 2.31 42.31.32	30.59	42.47. 2
Sept. 19	ut ſupra	94636 92921	43.25.17 42.53.56	43.26. 7 42.54.45	31.22	43.10.26
Sept. 20	ut ſupra	95966 94194	43.49.14 43.17.16	43.50. 4 43.18. 5	31.59	43.34. 5
Sept. 21	pallido	97248 95509	44.12. 3 43.41. 3	44.12.54 43.41.53	31. 1	43.57.23
Sept. 23	clariſſimo, & tremulo	99961 98150	44.59.21 44.27.55	45. 0.13 44.28.46	31.27	44.44. 0
Sept. 24	pallido	101339 99504	45.22.52 44.51.28	45.23.45 44.52.20	31.25	45. 8. 3

Sept.

1736		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum*	*Diſt. a vertice vera limborum*	*Diam. app. Solis*	*Diſt. a vertice vera centri*
			G ′ ″	G ′ ″	′ ″	G ′ ″
Sept. 26	pallido	104160 102259	46.10. 3 45.38.24	46.10.57 45.39.17	31.40	45.55. 7
Sept. 29	pallido	108529 106527	47.20.33 46.48.37	47.21.30 46.49.32	31.58	47. 5.31
Sept. 30	clariſſimo, & tremulo	110028 107992	47.44. 1 47.12. 3	47.44.58 47.12.59	31.59	47.28.59
Oct. 1	ut ſupra	111520 109487	48. 7. 3 47.35.36	48. 8. 1 47.36.33	31.28	47.52.17
Oct. 3	claro	114602 112513	48.53.34 48.22.12	48.54.34 48.23.11	31.23	48.38.53
Oct. 4	clariſſimo, & tremulo	116172 114055	49.16.43 48.45.24	49.17.44 48.46.33	31.11	49. 2. 8
Oct. 6	ut ſupra	119390 117187	50. 3. 4 49.31.30	50. 4. 7 49.32.32	31.35	49.48.19
Oct. 9	ut ſupra	124364 122078	51.11. 8 50.40.39	51.12.13 50.41.43	30.30	50.56.58
Oct. 13	ut ſupra	131282 128837	52.42.11 52.10.57	52.43.21 52.12. 5	31.16	52.27.43
Oct. 20	pallido	144209 141350	55.15.41 54.43.19	55.16.57 54.44.33	32.24	55. 0.45
Oct. 21	claro	146141 143311	55.37. 5 55. 5.37	55.38.22 55. 5.52	32.30	55.22. 7
Oct. 22	clariſſimo, & tremulo	148106 145215	55.58.19 55.26.50	55.59.38 55.28. 7	31.31	55.43.52
Oct. 23	ut ſupra	150092 147144	56.19.35 55.48. 0	56.20.55 55.49.18	31.37	56. 5. 6
Oct. 24	ut ſupra	152144 149085	56.41. 3 56. 8.53	56.42.24 56.10.12	32.12	56.26.18
Oct. 25	ut ſupra	154151 151073	57. 1.41 56.29.53	57. 3. 3 56.31.13	31.50	56.47. 8

1736		*Tangentes correctæ a penumbra*	*Diſt. a vertice apparens limborum* G ′ ″	*Diſt. a vertice vera limborum* G ′ ″	*Diam. app. Solis* ′ ″	*Diſt. a vertice vera centri* G ′ ″
Oct. 31	ut ſupra Lilius	166643 163209	59. 1.58 58.30.13	59. 3.28 58.31.41	31.47	58.47.34
*Nov.*1	ut ſupra	168754 165262	59.21. 0 58.49.19	59.22.32 58.50.48	31.44	59. 6.40
*Nov.*2	ut ſupra	170898 167337	59.39.54 59. 8.16	59.41.26 59. 9.46	31.40	59.25.36
*Nov.*6	pallidiſſimo	179642 175808	60.53.50 60.22. 7	60.55.28 60.23.43	31.45	60.39.35
*Nov.*10	clariſſimo, & tremulo	188504 184375	62. 3.16 61.34.22	62. 4.59 61.36. 3	28.56	
*Nov.*11	ut ſupra	190708 186520	62.19.45 61.48.10	62.21.29 61.49.51	31.38	62. 5.40
*Nov.*13	pallido	195138 190784	62.52. 0 62.20.20	62.53.47 62.22. 4	31.43	62.37.55
*Nov.*14	clariſſimo, & tremulo	197356 192900	63. 7.44 62.35.52	63. 9.32 62.37.37	31.55	62.53.34
*Nov.*15	claro	199526 195008	63.22.50 62.51. 5	63.24.38 62.52.50	31.48	63. 8.44
*Nov.*16	clariſſimo, & tremulo	201719 197104	63.37.51 63. 5.59	63.39.40 63. 7.46	31.54	63.23.43
*Nov.*20	pallido	210346 205437	64.34.24 64. 2.41	64.36.18 64. 4.32	31.46	64.20.25
*Nov.*25	claro	220557 215241	65.36.45 65. 4.51	65.38.45 65. 6.49	31.56	65.22.47
*Nov.*26	claro	222508 217078	65.48. 0 65.15.58	65.50. 1 65.17.56	32. 5	65.33.58
*Nov.*27	clariſſimo	224436 218908	65.59. 3 65.26.19	66. 1. 6 65.28.29	32.47	65.44.52
*Nov.*29	pallido	228110 222440	66.19. 8 65.47.36	66.21.12 65.49.37	31.35	66. 5.24

Nov.

1736		Tangentes correctæ a penumbra	Diſt. a vertice apparens limborum	Diſt. a vertice vera limborum	Diam. app. Solis	Diſt. a vertice vera centri
			G ′ ″	G ′ ″	′ ″	G ′ ″
Nov. 30	clariſſimo, & tremulo	229876 224150	66.29.25 65.57.25	66.31.31 65.59.28	32. 3	66.15.29
Dec. 2	ut ſupra	233257 227366	66.47.40 66.15.33	66.49.47 66.17.37	32.10	66.33.42
Dec. 5	ut ſupra	237852 231754	67.11.57 66.39. 5	67.14. 7 66.41.11	32.56	66.57.49
Dec. 8	claro	241778 235568	67.31.48 66.59.55	67.34. 1 67. 2. 4	31.57	67.18. 2
Dec. 9	clariſſimo, & tremulo	242937 236674	67.37.36 67. 5.41	67.39.48 67. 7.50	31.58	67.23.49
Dec. 11	ut ſupra	245044 238636	67.48. 1 67.15.51	67.50.15 67.18. 1	32.14	67.34. 8
Dec. 12	claro	245944 239505	67.52.25 67.20.17	67.54.40 67.22.28	32.12	67.38.34
Dec. 22	claro	249893 243219	68.11.26 67.39. 0	68.13.43 67.41.14	32.29	67.57.29
Dec. 23	clariſſimo,& valde tremulo	249715 243045	68.10.34 67.38. 8	68.12.51 67.40.22	32.29	67.56.37
Dec. 24	ut ſupra	249440 242821	68. 9.16 67.37. 1	68.11.33 67.39.14	32.19	67.55.24
Dec. 25	ut ſupra	249108 242478	68. 7.40 67.35.17	68. 9.56 67.37.30	32.26	67.53.43
Dec. 26	ut ſupra	248627 242053	68. 5.21 67.33.20	68. 7.37 67.35.32	32. 5	67.51.34
Dec. 27	pallidiſſimo	248132 241605	68. 3. 0 67.30.55	68. 5.16 67.33. 7	32. 9	67.49.11
Dec. 28	clariſſimo	247473 240954	67.59.50 67.27.39	68. 2. 6 67.29.51	32.15	67.45.58
Dec. 29	ut ſupra	246774 240241	67.56.24 67.24. 2	67.58.40 67.26.13	32.27	67.42.27

FINIS.

Vidit D. Jo: Hieronymus Gazoni Viſitator Generalis Clericor. Regular. S. Pauli, & in Eccleſia Metropolitana Bononiæ Pœnitent. pro Eminentiſſimo, ac Reverendiſſimo Domino D. Proſpero Cardinali de Lambertinis Archiepiſcopo Bononiæ, & Sac. Rom. Imp. Principe.

Ad Illuſtriſſimum, & Excellentiſſimum D. Hieronymum Hilarium Chierici Publicum Theologiæ Profeſſorem, ut videat & referat pro S. Officio

F. Pius Cajetanus Cadolini Vic. Gen. S. Officii Bononiæ.

VEre effatum eſt antiquorum: Ab ungue Leonem. Talem ſe in hoc opere exhibet celeberrimus Vir Euſtachius Manfredi in hoc Archigymnaſio publicus Aſtronomiæ Profeſſor; dignum propterea eſt, & maximè dignum, quod prælo mandetur. Ita cenſeo, ſi tamen placuerit Reverendiſſimo Patri hac die 31 menſis Julii anni 1736.

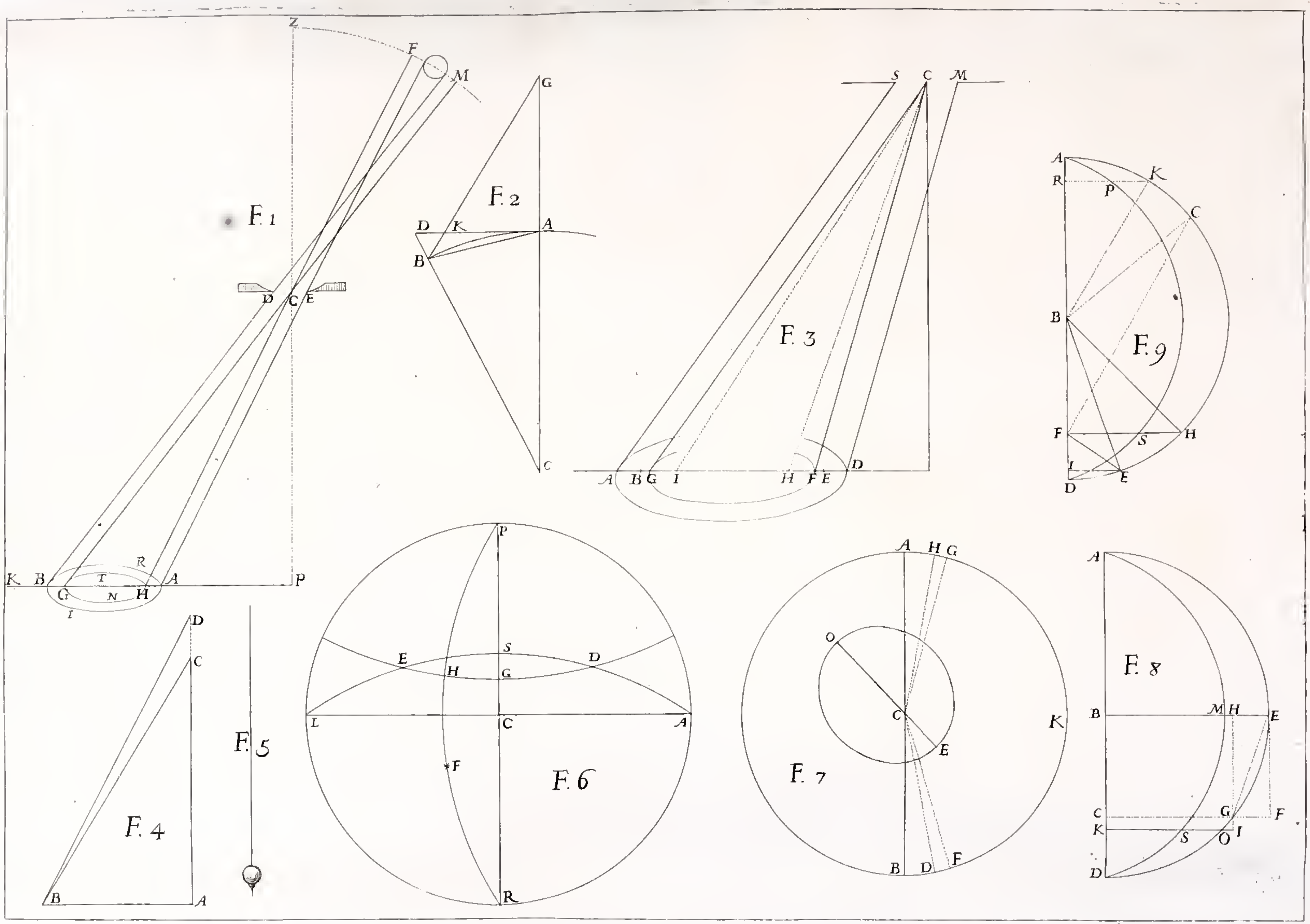
Hieronymus Hilarius à Clerico S. Theol. Doct. Colleg. Lect. publ. &c.

31 *Julii* 1736

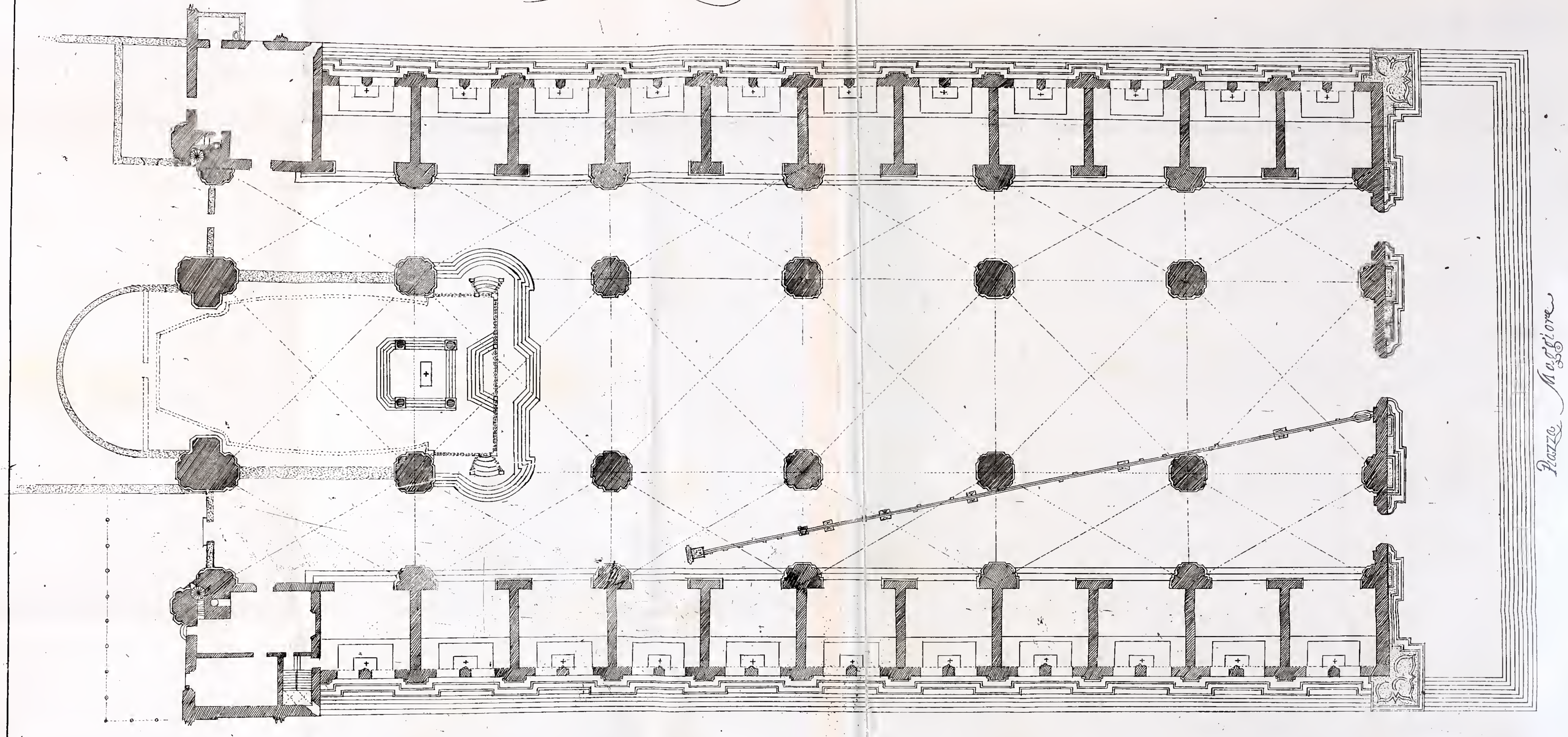
Stante præmiſſa atteſtatione

IMPRIMATUR

F. Pius Cajetanus Cadolini Vicarius Generalis S. Officii Bononiæ.


F. 1
Z F M D C E K B G T N R H A P I
F. 2
G D K A B C
F. 3
S C M A B G I H F E D
F. 4
D C B A
F. 5
F. 6
P E S D H G L C A F R
F. 7
A H G O C K E B D F
F. 8
A B M H E C G F K S O I D
F. 9
A R P K C B F S H I D E

PIANTA DELLA CHIESA PRESENTE DI S. PETRONIO



Scala di Piedi n.ro 70 di Bologna

5 3 1 5 10 15 20 25 30 35 40 45 50 55 60 65

Io Egidio M.a Bordonj diſsegnai ed' intagliai

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